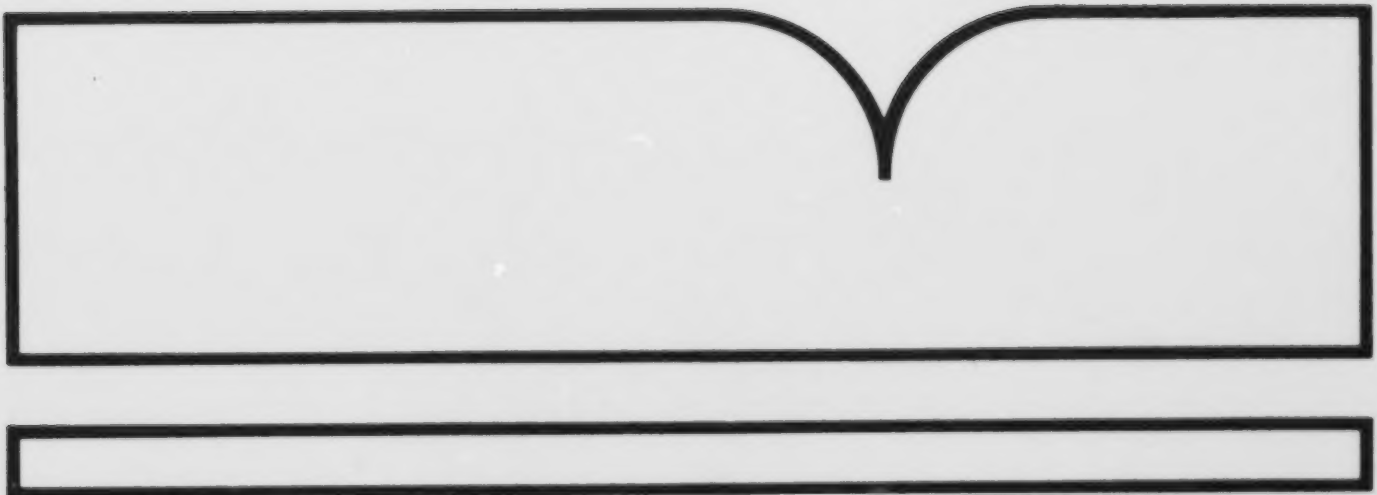


Superfund Record of Decision (EPA Region 2)
Florence Land Recontouring (FLR) Landfill
Florence, Mansfield, and Springfield, New Jersey
June 1986

(U.S.) Environmental Protection Agency
Washington, DC

27 Jun 86



U.S. Department of Commerce
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EPA/ROD/R02-86/024
June 1986



Superfund Record of Decision:

Florence Landfill, NJ

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TECHNICAL REPORT DATA (Please read Instructions on the reverse before completing)		
1. REPORT NO. EPA/ROD/R02-86/024	2.	3. RECIPIENT'S ACCESSION NO. PB87 183794/AS
4. TITLE AND SUBTITLE SUPERFUND RECORD OF DECISION Florence Landfill, NJ	5. REPORT DATE June 27, 1986	
	6. PERFORMING ORGANIZATION CODE	
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.	
	11. CONTRACT/GRANT NO.	
12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency 401 M Street, S.Wt Washington, D.C. 20460	13. TYPE OF REPORT AND PERIOD COVERED Final ROD Report	
	14. SPONSORING AGENCY CODE 800/00	
15. SUPPLEMENTARY NOTES		
16. ABSTRACT The Florence Land Recontouring (FLR) Landfill is a 60-acre site located on Cedar Lane Extension in the Townships of Florence, Mansfield, and Springfield in Burlington County, New Jersey. The site consists of a 29-acre landfill, two lagoons, a pond and two tanks, and is located in a combined residential-agricultural area. The site is bounded by land purchased by Burlington County for a new 600-acre solid waste management facility and by Assiscunk Creek, a tributary to the Delaware River which is used for recreation and irrigation. The FLR landfill was operated as a solid waste disposal facility from late 1973 to late 1981 and was permitted to accept sanitary and non-chemical industrial wastes. In 1975, the New Jersey Department of Environmental Protection investigated chemical waste disposal at the site and disclosed that 95 tons of hazardous waste consisting of phthalates, heavy metals and vinyl chloride monomers had been illegally disposed at the site. Elevated levels of hazardous substance have been discovered in soils and groundwater within the landfill. The selected remedial alternative includes: construction of a synthetic membrane and clay composite cap, a circumferential soil/bentonite slurry containment wall, an upgradient ground water interceptor system and a new stormwater management system; leachate treatment and disposal at a POTW or the Burlington County Solid Waste Composting gas collection and treatment; removal and disposal of lagoon liquids and sediments, etc. (See Attached Sheet)		
17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field Group
Record of Decision Florence Landfill, NJ Contaminated Media: gw, soil, sediments Key contaminants: heavy metals, phthalates, phenols, VOCs		
18. DISTRIBUTION STATEMENT	19. SECURITY CLASS (This Report) None	21. NO. OF PAGES 154
	20. SECURITY CLASS (This page) None	22. PRICE



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Florence Landfill, NJ

16. ABSTRACT (continued)

other surface debris; construction of a partial fence with warning signs; and supplemental sampling of ground water, surface water and sediments during design. The estimated capital cost for the selected remedy is \$8,021,000 with annual O&M costs of \$170,000.

RECORD OF DECISION
REMEDIAL ALTERNATIVE SELECTION

Site Florence Land Recontouring (FLR) Landfill, Florence,
Mansfield, and Springfield, New Jersey

Documents Reviewed

I am basing my decision on the following documents describing the analysis of cost-effectiveness of remedial alternatives for the FLR Landfill site:

- Remedial Investigation/Feasibility Study for the FLR Landfill, Black & Veatch Engineers-Architects, May 1986;
- Staff summaries and recommendations;
- Responsiveness Summary, June 1986.

Description of Selected Remedy

- Construction of a synthetic membrane and clay composite cap;
- Construction of a circumferential soil/bentonite slurry containment wall;
- Construction of an upgradient ground-water interceptor system;
- Construction of a new stormwater management system;
- Leachate treatment and disposal at a POTW or the Burlington County Solid Waste Management Facilities Complex;
- Gas collection and treatment;
- Removal and disposal of lagoon liquids and sediments, and other surface debris;
- Construction of a partial fence with warning signs;
- Supplemental sampling of ground water, surface water and sediments during design.

Declarations

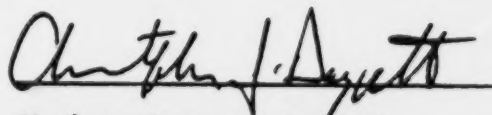
Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and the National Oil and Hazardous Substances Contingency Plan, 40 CFR Part 300, and pursuant to EPA Delegation Manual Order 14-5, I have determined that the remedy described above is the cost-effective remedial action alternative for the FLR Landfill site.

It is hereby determined that implementation of this remedial action is the lowest cost alternative that is technologically feasible and reliable, and which effectively mitigates and minimizes damages to and provides adequate protection of public health, welfare and the environment. It is also hereby determined that the selected remedy is appropriate when balanced against the availability of Trust Fund monies for use at other sites.

The State of New Jersey has been consulted and agrees with the selected remedy.

JUNE 27, 1986

Date


Christopher J. Daggett
Regional Administrator

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
FLORENCE LAND RECONTOURING LANDFILL SITE

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- 1. Analytical Data**
- 2. Responsiveness Summary**

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**SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
FLORENCE LAND RECONTOURING LANDFILL
FLORENCE, MANSFIELD, AND SPRINGFIELD, NEW JERSEY**

SITE LOCATION AND DESCRIPTION

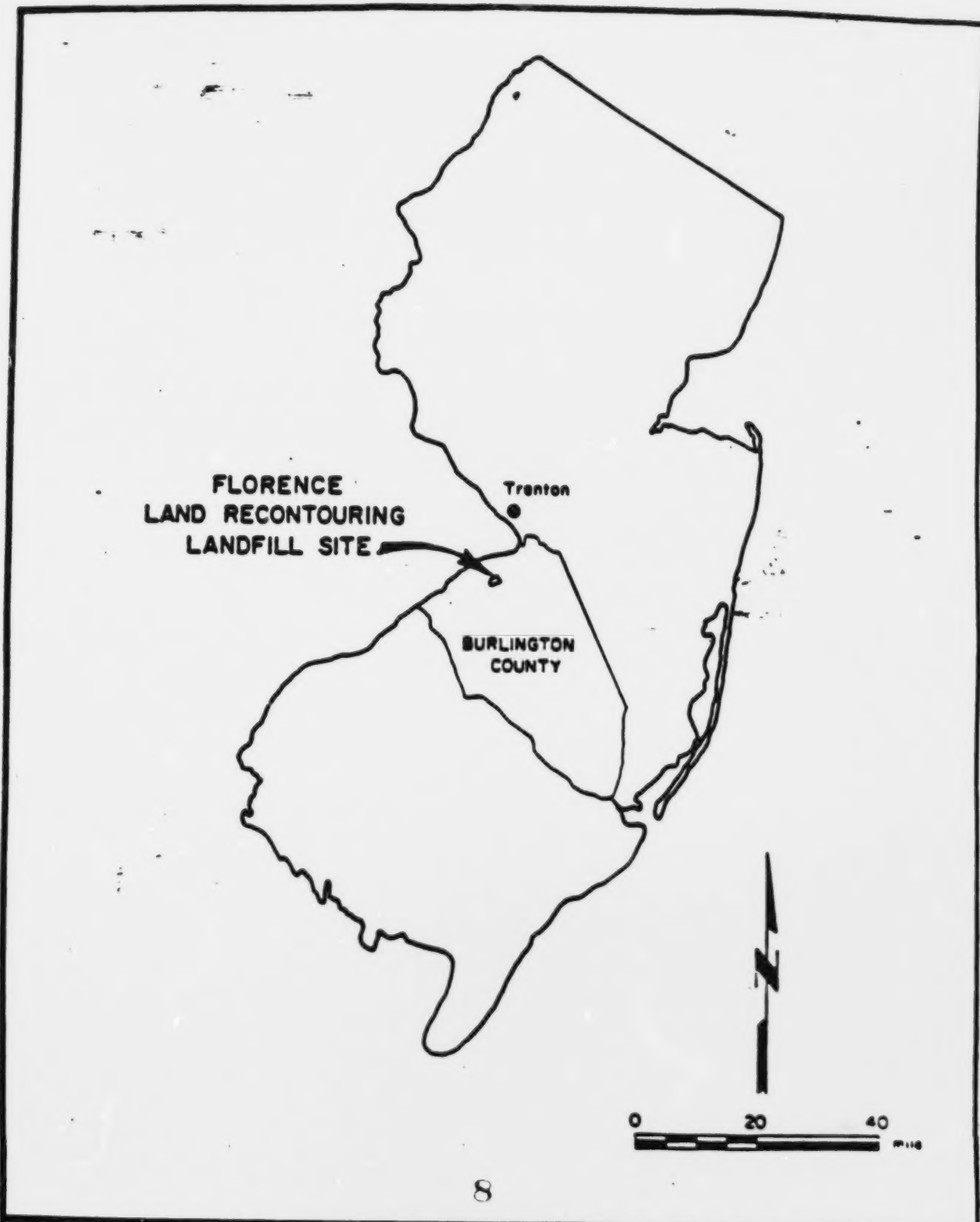
The Florence Land Recontouring (FLR) Landfill is located on Cedar Lane Extension in the Townships of Florence, Mansfield, and Springfield in Burlington County, New Jersey (see Figure 1). The site is situated between the New Jersey Turnpike and I-295, one mile south of Interchange 52 on I-295 (see Figure 2). More specifically, the landfill property is delineated as Block 173, Lots 1, 2, 3A and 3B in Florence; Block 44, Lot 7 and Block 44A, Lot 8 in Mansfield; and Block 304, Lot 1 in Springfield. These parcels of land cover an area of about 60 acres. The site includes a 29-acre landfill, two leachate collection lagoons, a pond believed to have been formed by excavation of soils, which were used as landfill cover material, and two empty tanks.

The area surrounding FLR is predominantly residential and agricultural. Adjacent to most of the site perimeter are lands recently acquired by Burlington County for the implementation of a new 600-acre solid waste management facility. The remaining site boundaries are formed by the Assiscunk Creek. The creek flows in a southerly direction, is a tributary to the Delaware River and is used for both noncontact recreational purposes and for irrigation.

The FLR Landfill lies above the Raritan-Magothy Aquifer, a major source of drinking water for the area. The Raritan-Magothy Formation comprises about 150 feet of interbedded sands, silts and clays. Separating the landfill from this aquifer is 50 to 70 feet of Merchantville Clay. Overlying the Merchantville are Pleistocene deposits varying from zero to 25 feet in thickness, which consist of sand, silt and clay. The surficial Pleistocene Aquifer is used as a water supply, but to a lesser extent than the Raritan-Magothy. Flow in both the Pleistocene and Raritan-Magothy is in the south-southeast direction toward the Assiscunk Creek. Based on existing hydraulic gradients, leachate from the landfill has the potential to flow out of the fill into the adjacent surficial Pleistocene Aquifer. Since ground water from the Pleistocene Aquifer discharges into the Assiscunk Creek, the creek acts as a natural hydraulic barrier to further contaminant transport in the ground water beyond the creek.

SITE HISTORY

The FLR Landfill was operated as a solid waste disposal facility from November 1973 until November 1981. Florence Land Development, a partnership, owned the site from April 1974 to May 1978. Since



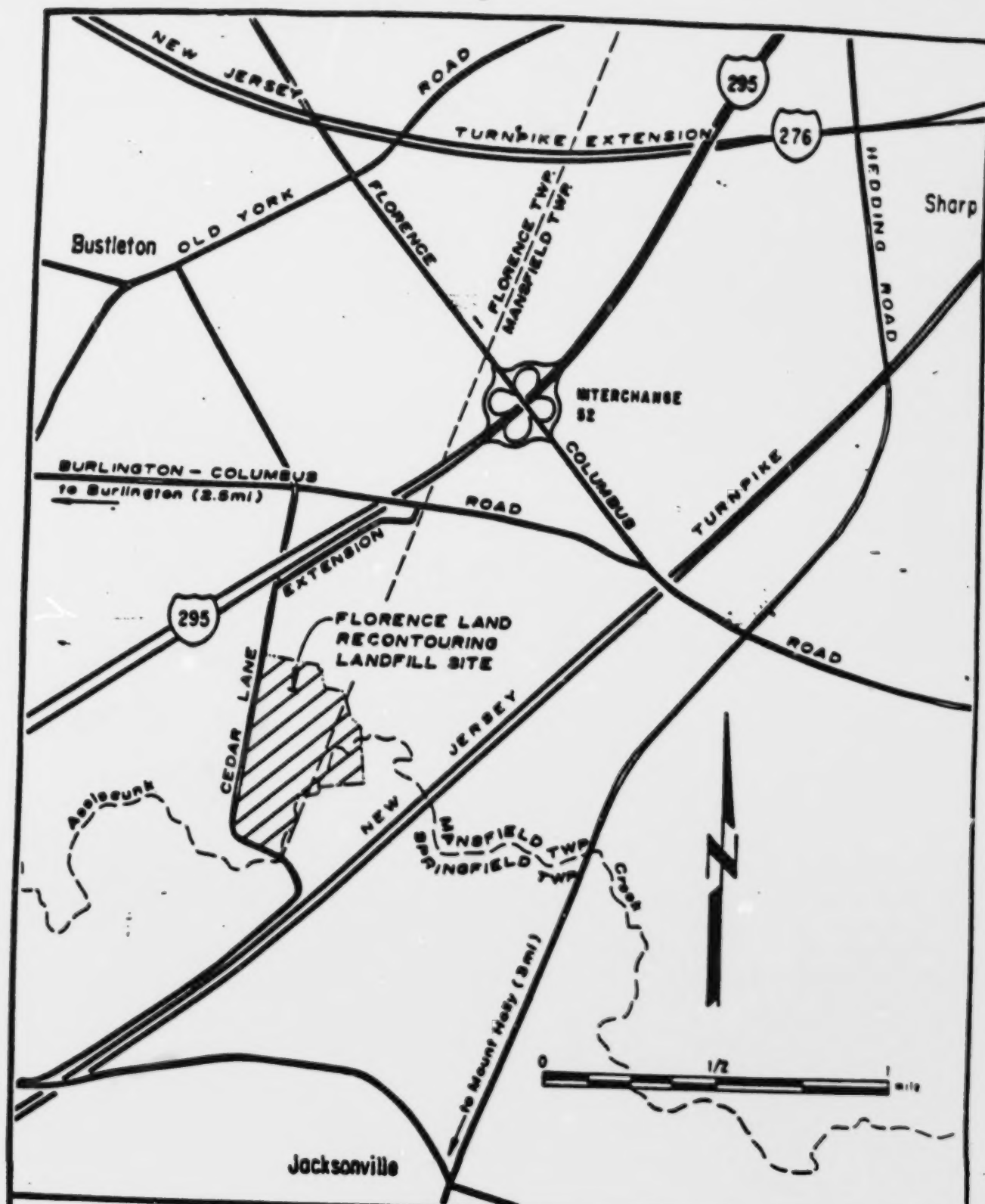
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GENERAL SITE LOCATION

BLACK & VEATCH
Engineers - Architects

Florence Land Recontouring Landfill

Figure 1



SITE LOCATION

Black & Veatch
Engineers - Architects

Florence Land Recontouring Landfill

Figure 2

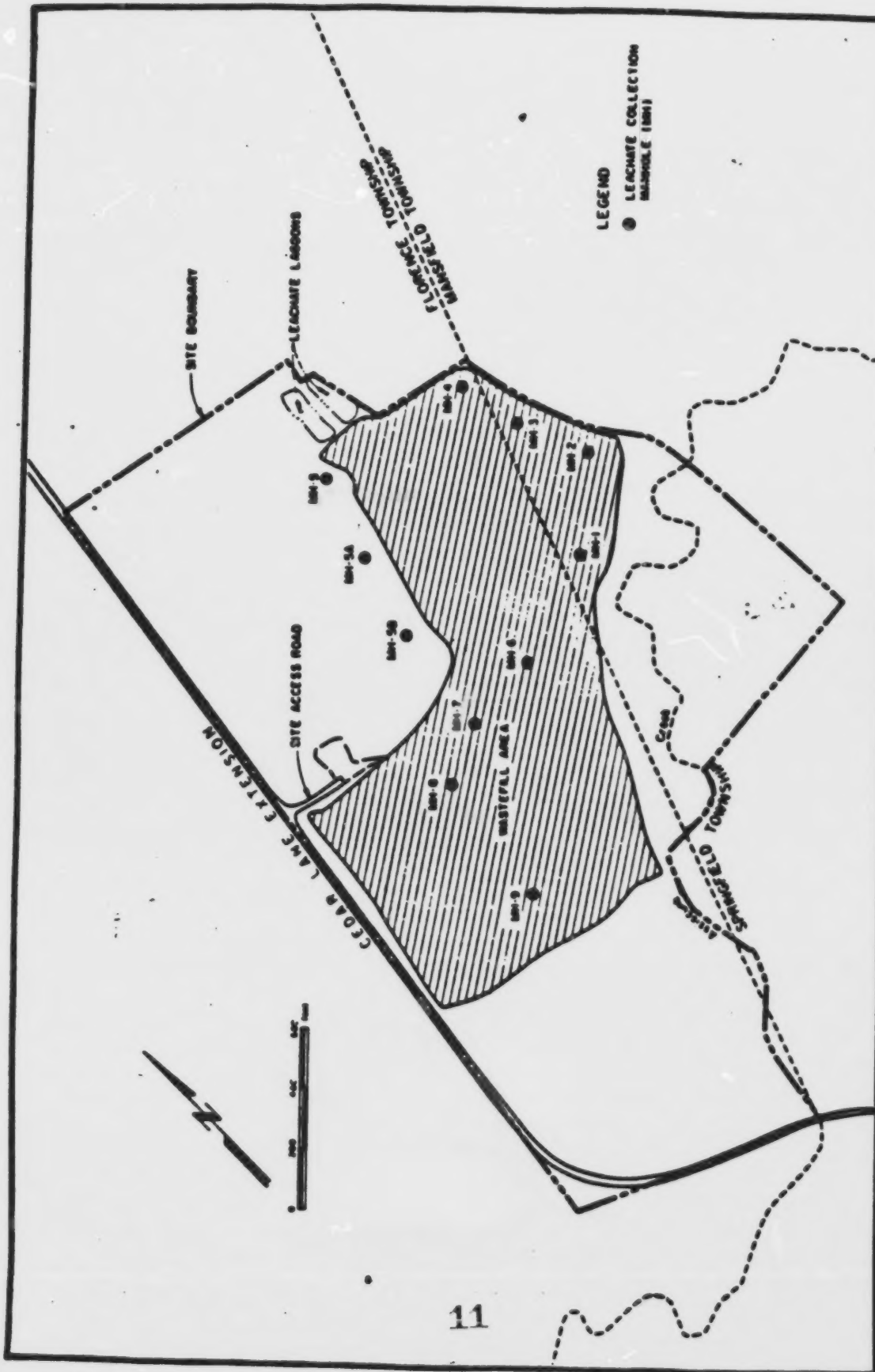
then, Florence Land Development, Inc. has owned the site. During all of its operating period except for 1977, the landfill was operated by Florence Land Recontouring (FLR), Inc. In 1977, the site was operated by Jersey Environmental Management Services (JEMS).

During its operation, the landfill was permitted to accept sanitary and industrial (non-chemical) waste, including septage and sewage sludge. In 1975, an investigation by the New Jersey Department of Environmental Protection (NJDEP) disclosed chemical waste disposal at the landfill. Due to a history of environmental concerns, including observed leachate seeps, potential ground-water contamination and emissions to the atmosphere, a Consent Order to alleviate and control further contamination was issued by the New Jersey Superior Court in January 1979. Elements of this order included a listing of permitted and prohibited waste types for acceptance at the facility; establishment of a sampling and analysis program for existing ground-water monitoring wells; specifications for site preparation, disposal limits, and operations; design and installation of a leachate collection system; pumping and removal of leachate to alleviate hydraulic head pressures; the construction of cutoff walls, dikes, and wastefill gas vents; provisions for the control of litter, dust, odor, noise and fire protection, and the establishment of the final elevation and depth of excavation. Leachate removed from the landfill is being discharged to the Willingboro Wastewater Treatment Plant under NJPDES/SIU Permit #NJ0029289. Compliance with the Consent Order has been sporadic. Quarterly responses to the order have been prepared by FLR's consultant, M. Disko Associates, since its issuance in January 1979.

In July 1981, FLR, Inc. submitted a final landfill closure plan, and operations terminated in November 1981. Following this closure plan, the wastefill area was capped with on-site clayey material reported to be Merchantville Clay and subsequently revegetated. The extent and level of accuracy to which landfill construction, operations, and closure were performed as represented by design drawings and reports are unknown. A general site plan is presented in Figure 3.

The quarterly reports prepared by FLR's consultants have demonstrated inadequate leachate removal. Due to the lack of compliance with the Consent Order, NJDEP brought FLR to court in August 1985. At that time, FLR was directed to remove 350,000 gallons per month from the manholes of the leachate collection system.

Reports filed with the NJDEP by industrial generators indicated that 95 tons of hazardous waste were disposed at the FLR Landfill site. These wastes reportedly contained phthalates, heavy metals, and vinyl chloride monomers.



SITE PLAN

Florence Land Recontouring Landfill

Figure 3

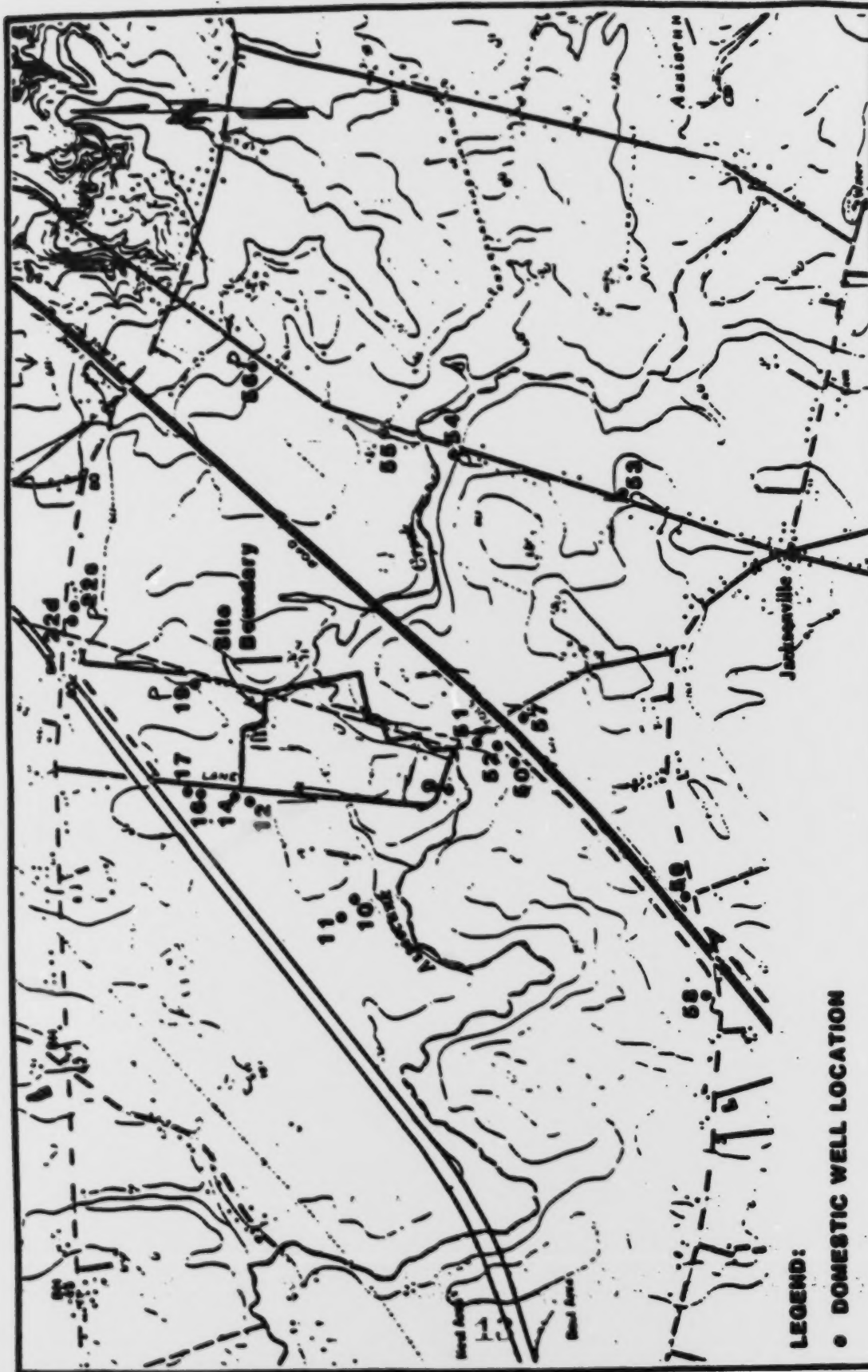
Black & Veatch
Engineers Architects

CURRENT SITE STATUS

Residents in the general area of the site have been complaining of private potable well contamination, which they believe originates from FLR, for several years. In 1985, NJDEP Division of Water Resources found petroleum hydrocarbon contamination in the supply of the Columbus Water Company, which is located in Mansfield Township. NJDEP concluded that the petroleum hydrocarbons detected in water samples originated from within the water company's system. The system was subsequently cleaned to eliminate the water problem. In response to complaints by Mansfield Township residents of potable well contamination, EPA sampled thirteen potable wells both upgradient and downgradient of the site including the Columbus Water Company in August 1985. One chemical compound, bis(2-ethylhexyl) phthalate, was detected in the samples, as well as in the laboratory blank prepared for data validation purposes. EPA concluded that the presence of this chemical in the blank indicated that it was introduced in the laboratory.

Samples were collected from twenty domestic water-supply wells installed in both the shallow Pleistocene and deep Raritan-Magothy Aquifers and located hydraulically upgradient and downgradient of the site as part of the remedial investigation. The locations of these wells are provided on Figure 4. Methylene chloride and bis(2-ethylhexyl) phthalate were the only volatile and base neutral compounds found in twelve of the twenty samples. These compounds were found at low levels, none of which exceeded 23 ppb. Their presence may be due to laboratory contamination since these particular compounds are frequently laboratory introduced during analysis. Additional sampling and analysis would be required to make a more definite conclusion. It should be noted that the levels found are significantly lower than EPA drinking water criteria. Domestic well water data are summarized on Table 1 in Attachment 1.

Elevated levels of hazardous substances were detected in the landfill material and in ground water from monitoring wells within the landfill. Leachate samples from the existing leachate collection system manholes contain much lower levels of contaminants than the ground water from the wells within the landfill. However, these samples are not as indicative of the leachate generated by the waste as samples from the landfill wells. This conclusion is based on the concept that ground water migrates along the path of least resistance, through the collection system where it dilutes the leachate, rather than flowing directly through the landfill materials. The locations of all sampling points are provided on Figure 5. Analyses of leachate collected from the manholes is presented on Table 2 in Attachment 1.



LEGEND:
• DOMESTIC WELL LOCATION

DOMESTIC WELL SAMPLING LOCATIONS

Florence Land Recontouring Landfill

Figure 4

BLACK & VEATCH
Engineering & Architecture



The landfill is situated in the surficial Pleistocene Formation. Organic compounds were detected in water samples from monitoring wells installed around the site in this aquifer. Well 4S, located hydraulically upgradient of the landfill but locally downgradient of the leachate lagoons, contained 10.46 ppb of total organic compounds. Wells 5S and 6S, located downgradient of the landfill, contained 231.61 ppb and 3.15 ppb of total organic compounds.

Interpretation of analytical results of water samples from wells in the Raritan-Magothy Aquifer indicate that the water quality upgradient and downgradient of the site is equivalent, which leads to the conclusion that water quality in this aquifer has not been impacted by the site. This conclusion is supported by the following: permeability in the 50 to 70 feet of Merchantville Clay was determined to be between 10^{-5} centimeters per second (cm/sec) and 10^{-7} cm/sec and pump tests performed on the Raritan-Magothy indicated no hydraulic connection between this aquifer and the Pleistocene Aquifer in which the landfill is located. Data collected indicates that there is no off-site plume. The presence of random contaminants detected in Raritan-Magothy samples, such as methylene chloride and bis(2-ethylhexyl) phthalate, will be addressed further in future sampling. Ground-water data is presented on Table 3 of Attachment 1.

Migration of contamination is further evidenced by the collected soil data. Levels of methylene chloride as high as 938 ppb were found within the landfill and were subsequently detected in downgradient borings at 172 ppb and 419 ppb. These levels far exceed the NJDEP guideline that methylene chloride be five times greater than the concentrations found in the blank to be considered an environmental contaminant. In addition, heavy metal analyses from soil borings outside the landfill indicate concentrations similar to and greater than in the landfill samples, which further supports that some migration from the landfill is occurring. The highest metal concentrations were found in the Merchantville Clay. This can be attributed to properties of clay which enable it to capture metals via an ion exchange mechanism. Soils data are summarized in Table 4 of Attachment 1.

Ground water downgradient of the site in the surficial aquifer flows into the Assiscunk Creek. Pentachlorophenol and phenol were detected in the surface-water and sediment samples from the creek. Their presence does indicate the impact of the landfill on the Pleistocene Aquifer. Surface-water and sediment data are summarized on Tables 5 and 6 in Attachment 1.

Air sampling performed at FLR using the flame ionization detector (FID) and photoionization detector (PID) showed elevated levels of volatile organic compounds at the site. The highest concentrations measured were found above manholes and monitoring wells. Background levels were detected at the site boundaries. In addition to the PID and FID sampling, carbon adsorption tubes

were used to identify specific compounds present in the air emissions. Although the recommended holding times were exceeded, benzene and toluene were detected in the air samples. An air model was used to estimate the concentration of volatiles at the nearest off-site residence, which was calculated to be 0.453 ppm. Assuming that this were entirely benzene or entirely toluene, this value is insignificant in relation to potential health impacts. Since emissions were not detected at the site boundaries and were not calculated to be of significant levels at the nearest residence, it can be concluded that off-site air emissions from FLR do not pose a public health threat.

Public health concerns at the FLR Landfill site in its current condition are summarized below.

- The ground water in the landfill is contaminated and there is a potential for migration into the adjacent Pleistocene Aquifer and the lower Raritan-Magothy Aquifer. There are a limited number of homes with potable wells in the Pleistocene Aquifer downgradient of the site due to the short distance between the landfill and the Assiscunk Creek, which acts as a hydraulic barrier to ground-water transport. These homes are being purchased by Burlington County, which will leave no potable wells immediately downgradient of the site in this aquifer. Contaminated ground water from the site is expected to reach the drinking water supplies in the Raritan-Magothy in a minimum of twenty-four years if no remedial action is implemented. There are approximately 500 persons within a three-mile radius downgradient of the site with potable wells in the Raritan-Magothy.
- The Assiscunk Creek has shown minimal impacts from the FLR Landfill. However, there is a potential for contaminants to migrate to the creek via surface-water runoff and ground-water flow in the surficial Pleistocene Aquifer. The creek is used for recreation and irrigation purposes and is considered an exposure pathway through dermal contact and ingestion.
- The air investigation has not shown the air emissions from FLR to pose a health threat off-site. The concentrations of total volatile organics found on-site are at levels high enough to pose a health threat depending on the specific chemicals present. The remedial investigation, however, did not detect particular chemicals at the concentrations of total volatile organics measured. Air emissions are an exposure pathway through inhalation.
- Hazardous substances found in the landfill may be present at the ground surface on-site and may present an exposure pathway through dermal contact.

ENFORCEMENT

An investigation to identify potentially responsible parties (PRPs) is in progress for purposes of potential cost recovery and enforcement actions in regard to future costs of remedial activities. Parties identified as PRPs will be sent notice letters offering them the opportunity to perform the design and construction activities recommended in this document before EPA and NJDEP make a decision to fund any future work.

ALTERNATIVES EVALUATION

The feasibility study process involves, as a first step, selecting technologies that are appropriate for remedying the public health and environmental concerns associated with a particular site. In the case of FLR, the remedial objective is to control the potential release of contaminants from the landfill. Based on the general exposure pathways, more specific objectives were established:

- Mitigate downgradient, off-site ground-water contamination
- Mitigate on-site surface-water runoff contamination
- Mitigate off-site air contamination
- Mitigate the potential for health hazard exposure and enhance on-site safety

The remedial measures evaluated were designed to alleviate the potential public health risks and environmental impacts associated with the landfill wastes.

Considering available technologies and the site's existing physical conditions, several remedial alternatives were developed and are listed in Table 1. Capital costs, operation and maintenance costs, and total present worth costs for the alternatives are provided in Table 2. Present worth costs for all alternatives were calculated using a thirty year life cycle as a basis for comparison of these costs. A more detailed description of the technology screening and remedial alternative development can be found in Volume 3 of the Remedial Investigation/Feasibility Study dated May 1986. The remedial alternative descriptions that follow identify each action, present the effectiveness and cost of the action, and address the alternative's consistency with other environmental laws. Consistency with other environmental laws is described more completely in a latter section of this document.

Alternative 1 - No Action

Under the No Action alternative, all current leachate handling activities would be abandoned. Monitoring of air, ground water, and surface waters, and periodic site inspections would continue as operation and maintenance.

TABLE 1
DESCRIPTION OF REMEDIAL ALTERNATIVES

Alternative 1 - No Action

- Termination of leachate pumping and removal

Alternative 2

- Maintenance of current volumes of leachate pumping and removal
- Leachate treatment and disposal at an off-site POTW
- Temporary leachate storage in an on-site tank prior to transport to POTW
- Replacement of carbon filters above manholes
- Repairs to existing cap and stormwater management system

Alternative 3

- Circumferential barrier wall with upgradient ground water interceptor and diversion trench
- RCRA compliant composite cap
- Leachate removal using present leachate collection system
- Temporary leachate storage in an on-site tank prior to transport to an off-site POTW or BCSWMFC
- Passive gas collection system with activated carbon treatment
- New stormwater management system

Alternative 4

- New synthetic membrane cap and stormwater management system
- Extraction wells augmenting present leachate collection system
- Direct leachate discharge to BCSWMFC for treatment
- Active gas collection and direct discharge to BCSWMFC for incineration

Alternatives 5, 6, and 7

- Partial upgradient barrier wall with upgradient ground-water interceptor and diversion trench
- New synthetic membrane cap and stormwater management system
- Extraction wells augmenting present leachate collection system
- Active gas collection

Treatment Options

Alternative 5 - Leachate and gas treatment at BCSWMFC

Alternative 6 - On-site leachate pretreatment; temporary storage in on-site tank and truck transport to POTW; on-site gas incineration

Treatment Options (continued)

Alternative 7 - On-site leachate treatment and discharge to
Assiscunk Creek; on-site gas incineration

Actions Common To All Alternatives

- Partial fence installation
- Long-term air and water-quality monitoring

Actions Common To Alternatives 2 through 7

- Lagoon removal
- Debris removal
- Archeological investigations

TABLE 2
CAPITAL COSTS, OPERATION AND MAINTENANCE
COSTS, AND PRESENT WORTH COSTS

<u>Alternative</u>	<u>Capital Cost (\$)</u>	<u>Annual Operation & Maintenance (\$)</u>	<u>Present Worth (\$)</u>
1	62,000	48,000	453,000
2	469,000	394,000	4,172,000
3	7,937,000	169,000	9,208,000
4	4,492,000	312,000	7,262,000
5	4,751,000	235,000	6,780,000
6	5,335,000	257,000	7,616,000
7	5,619,000	201,000	7,402,000

A partial fence with warning signs would be installed. It would serve to restrict site access, which would reduce the occurrences of direct contact with any hazardous materials and inhalation of high levels of volatile organics. The fence would extend from the Assiscunk Creek along the northern property line to Cedar Lane Extension and along Cedar Lane Extension and the southern fill area back to the creek (see Figure 6).

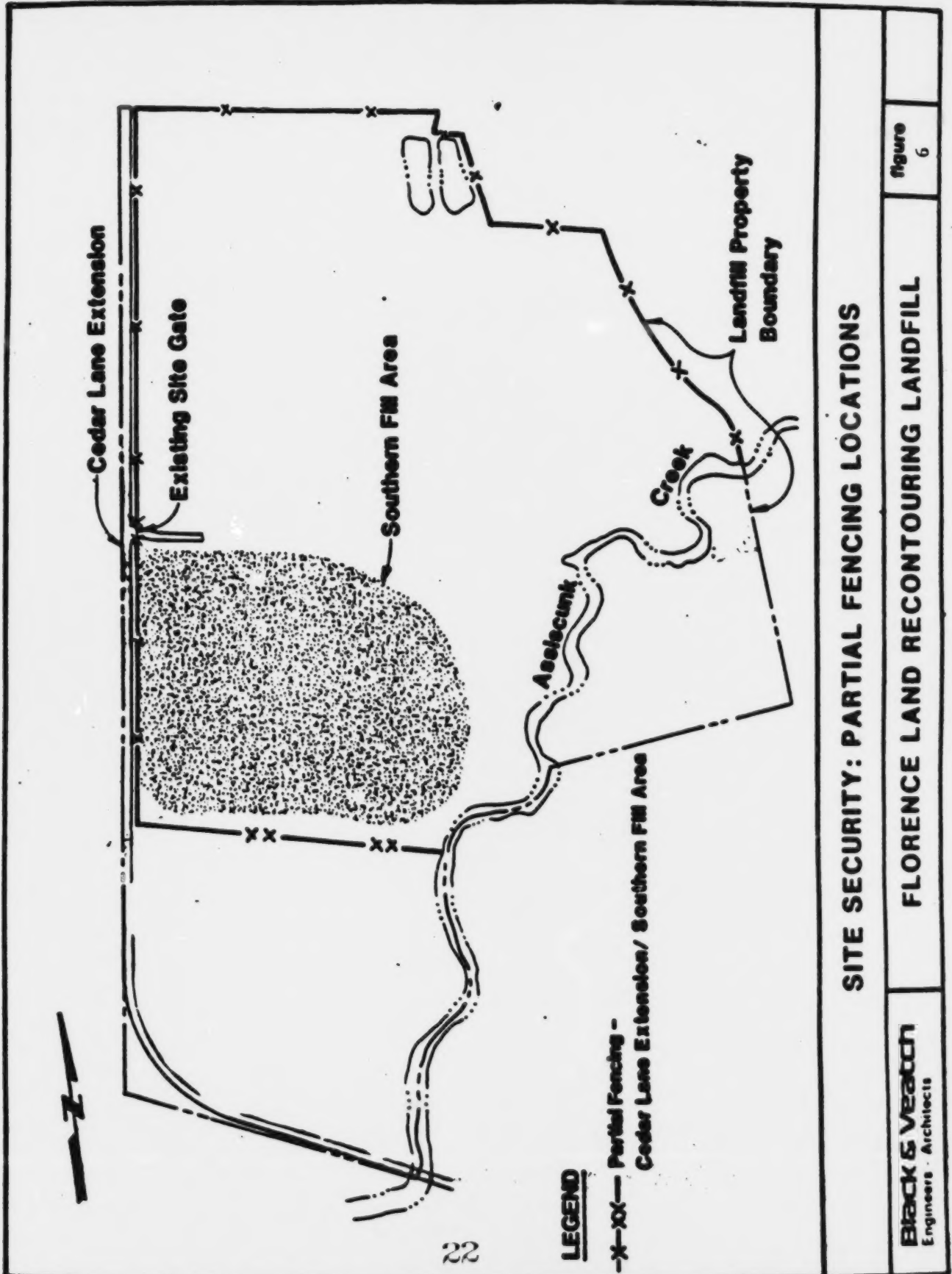
It is estimated that approximately 21,000 gallons per day (GPD) of leachate are currently generated by precipitation infiltration and ground-water inflow. An average of 12,000 GPD is currently removed by pumping performed in compliance with the NJDEP Consent Order. In addition to the potential for migration laterally into the Pleistocene Aquifer, the unremoved leachate could eventually create a hydrostatic pressure head sufficient to induce leachate migration into the underlying Merchantville Formation and ultimately encounter the Raritan-Magothy Aquifer.

The potential for surface-water runoff contamination would increase since the continued erosion of the existing soil cover would inevitably expose additional waste to surface-water runoff. The potential for off-site air contamination would incrementally increase over several years as the cap erodes sufficiently to facilitate the release of landfill gas. Since the activated carbon in the filters above the manholes is spent at present, the presence of the filters has no effect on air quality.

In addition, the potential for on-site safety and health hazard exposure would increase due to the cessation of leachate removal, which would permit leachate to accumulate in the manholes, and continued cap erosion, which would further expose waste and potentially create additional air emissions. Although installation of a partial fence around the site would discourage unauthorized site entry, the potential for on-site safety and health hazard exposure on the site itself would still increase.

Alternative 2

This alternative includes repairing the existing cap, replacing the carbon absorption filters, and maintaining the current practice for leachate handling (see Figure 7). On-site material would be used to repair the eroded portion of the cap for mitigation of surface-water runoff contamination. The existing drainage pipes and slope downpipes would be refurbished, and new dikes and flumes would be constructed to improve on-site drainage patterns. All areas disturbed by this activity would be revegetated. Air contamination would be addressed by replacing the existing carbon filters on the manholes with new carbon filters on a continuing basis. The existing leachate collection system would be utilized for collection from existing manholes for





transfer by truck to a publicly-owned treatment works (POTW) for treatment and disposal. The existing lagoons would be abandoned and a new 75,000 gallon leachate storage facility would be constructed for temporary storage. Reduction of the health and safety exposure would be achieved by removing the lagoons, on-site trailer, and miscellaneous debris for disposal at appropriate facilities. The fence would be installed as described in Alternative 1. Long-term air and water quality monitoring programs would be implemented for determination of the effectiveness of the improvements.

Under this alternative, the potential for ground-water, surface-water and air contamination is expected to be mitigated slightly due in part to the repair of the cover system and the replacement of the activated carbon filters on the manholes. In addition, continued removal of the leachate from the existing collection system, which would be cleaned and rehabilitated to increase pumping efficiency, would assist in minimizing any vertical and lateral migration of leachate. It should be noted that the repair of the cover system would only function to retard, not prevent precipitation infiltration.

It is estimated that approximately 21,000 GPD of leachate will be generated by precipitation infiltration and ground-water inflow into the wastefill. 12,000 GPD will be removed by the upgraded collection system, resulting in a net volume of 9,000 GPD of leachate to accumulate in the wastefill. While this alternative does provide for the capture of a portion of the potentially contaminated leachate, it does not prevent the migration of leachate downgradient of the site.

The potential for surface-water runoff contamination would decrease slightly as a result of repair of the existing cover system. However, discontinuities in the cap would be created by weathering, and erosion would occur at different rates in the cap even with periodic maintenance. Such irregular weathering would continue to create a potential for the contamination of surface-water runoff and infiltration.

The potential for off-site air contamination would be mitigated slightly as a result of the cap repair, which would promote the venting of emissions through the carbon filters. However, the carbon filters are not expected to treat the trace elements in landfill gas which cause odors; therefore, the nuisance potential of the emissions would not be mitigated. In addition, the potential for on-site safety and health hazard exposure would be mitigated by the installation of a partial fence around a portion of the site, the decommissioning of the lagoons, the repair of the cover system, and the replacement of the carbon in the manhole filters. Both the cap repair and the carbon filters are remedial measures which would require periodic maintenance and replacement in order to be effective.

Alternative 3

Alternative 3 is designed to minimize the volume of leachate produced by containing the waste (see Figure 8). A circumferential barrier wall would be constructed around the landfill from the ground surface into the Merchantville Clay. A relatively impermeable cover system compliant with Resource Conservation and Recovery Act (RCRA) requirements would be placed over the entire landfill. This cover consists of the following material layers in ascending elevation: one foot of coarse drainage material with a permeability less than 10^{-3} cm/sec containing a polyethylene pipe collection system for the controlled discharge of collected gases; two feet of compacted clay with a permeability coefficient less than 10^{-7} cm/sec; a synthetic membrane; one foot of coarse drainage material with 10^{-3} cm/sec permeability; filter fabric; and two feet of vegetative cover consisting of on-site soils. The unsuitably steep slopes along the eastern side of the landfill would be regraded to a slope no greater than two horizontal to one vertical (2:1). To aid in the control of ground-water migration, a ground-water interceptor system would be installed immediately upgradient of the cutoff wall. This system would serve to reduce the hydrostatic head on the barrier wall and enhance the reliability of the containment system. It would consist of perforated, heavy-duty tubing centered within crushed stone backfill. The piping would be connected to non-perforated conveyance piping for transmission around the northeastern perimeter of the site to a discharge near Assiscunk Creek. The leachate management system specified for Alternative 2 would be incorporated into this alternative. The amount of leachate generated and recovered would be significantly less so the leachate storage structure would have a 10,000-gallon capacity. The leachate would be periodically removed and discharged to a POTW or the BCSWMFC. The gases generated would migrate upward to the coarse cover layer and be directed by pipes to two atmospheric vents at the crown of the landfill. The gas would pass through activated carbon filters over each vent before being released to the atmosphere. A new stormwater management system would consist of seven riprap channels extending down the side slopes and an intercepting stormwater runoff conveyance channel over the cover in the northeastern sector of the landfill. Installation of a partial fence, removal of the lagoons, the on-site trailer and miscellaneous debris, as well as air and water quality monitoring would occur as in Alternative 2.

The installation of a circumferential wall, an upgradient ground-water interceptor, and a composite synthetic membrane/clay cover system would divert upgradient ground-water flow around the landfill, greatly reduce infiltration, and prevent the contact of surface-water runoff with the waste. They would serve to prevent the migration of leachate out of the landfill and the contamination of surface-water runoff. The full containment wall is supplemented by the RCRA compliant cap because the objective of this system is

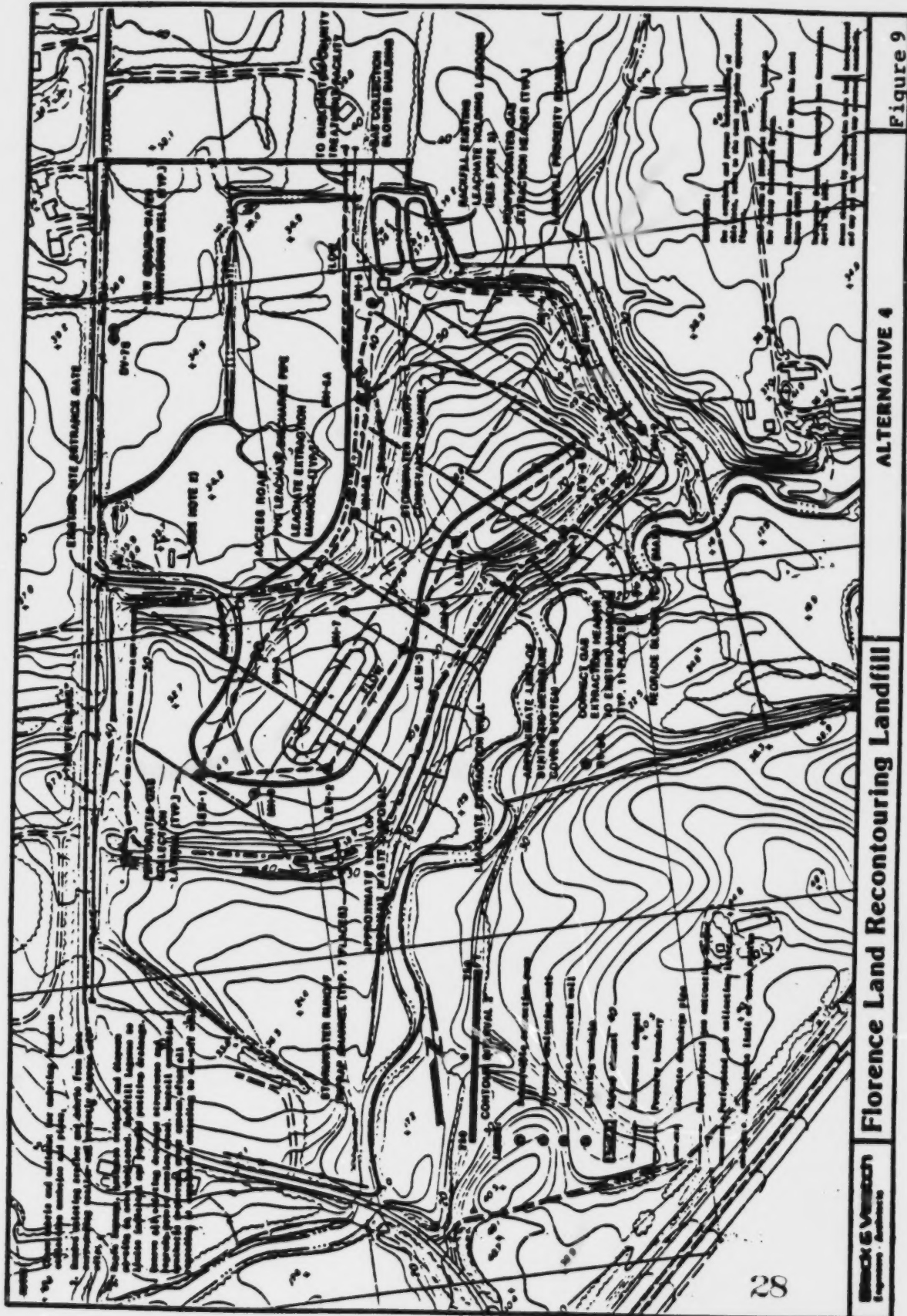


to minimize leachate production and this type of cap will provide the greatest assurance for preventing infiltration. It is estimated that the total volume of ground water and precipitation which infiltrates the wastefill would be 100 GPD. To arrive at this estimate, assumptions of negligible inflow through the barrier wall and less than 100 GPD through the cap based on a permeability of 10^{-11} cm/sec were used. A conservative volume of approximately 5,000 gallons per month of water infiltrating the landfill has been utilized for operation and maintenance cost estimation purposes. This infiltration would be removed by pumping from the cleaned and rehabilitated leachate collection system for subsequent disposal at a POTW or the Burlington County Solid Waste Management Facilities Complex (BCSWMFC).

The potential for air contamination is expected to be moderately mitigated by the installation of a synthetic membrane/clay cover system and coarse drainage blanket vent layer which would channel landfill gas to the manholes for venting through the replaced carbon filters. As discussed for Alternative 2, the activated carbon will not treat trace elements, such as hydrogen sulfide, in the landfill gas; therefore, the trace element odors will not be mitigated. Alternative 3 is expected to mitigate on-site safety and health hazards to a greater degree than Alternative 2 because of the superior cover system which would be installed.

Alternative 4

A new synthetic membrane cap would be constructed over the landfill to minimize infiltration and contamination of surface water runoff (see Figure 9). The cap would be constructed in the areas with slopes flatter than 3:1 of the following material layers in ascending elevation: one foot coarse drainage material with a permeability greater than 10^{-3} cm/sec; filter fabric; six inches of compacted on-site soils; a synthetic membrane; and two feet of vegetative cover. In the areas steeper than 3:1, a modified cap would be constructed. The cap would consist of the following material layers in ascending elevation: one foot coarse drainage material with a permeability less than 10^{-3} cm/sec and two feet of vegetative cover. A new system of surface-water controls, consisting of interceptor dikes, flumes and drainage pipes would be installed. Five extraction wells on the downgradient side of the site would augment the existing leachate collection system. Leachate would be directly discharged to the proposed BCSWMFC for treatment and disposal. An active gas extraction system consisting of a blower system that would withdraw directly from the headspace of the extraction wells, existing manholes, and from the perforated collection header of a new blanket layer to be placed over the landfill. The blower system would discharge directly to the BCSWMFC for treatment of the gases. Installation of the fence, removal of the lagoons, on-site trailer and miscellaneous debris, and long-term monitoring would occur as in Alternative 2.



Under Alternative 4, the potential for ground-water contamination would be moderately mitigated and the potential for surface-water and air contamination, and on-site safety and health hazard exposure would be significantly mitigated. The installation of a synthetic membrane cover system would prevent surface-water runoff contamination and minimize precipitation infiltration. However, upgradient ground-water infiltration into the wastefill would still create leachate, which would be extracted and transported to the BCSWMFC for treatment. It is estimated that approximately 10,000 gallons per day of leachate will be generated and this entire amount will be extracted from the manholes and new extraction wells. As with Alternative 2, while Alternative 4 provides for the capture of the potentially contaminated leachate, it does not prevent the potential for degradation of upgradient ground waters in the Pleistocene Aquifer that infiltrate the landfill.

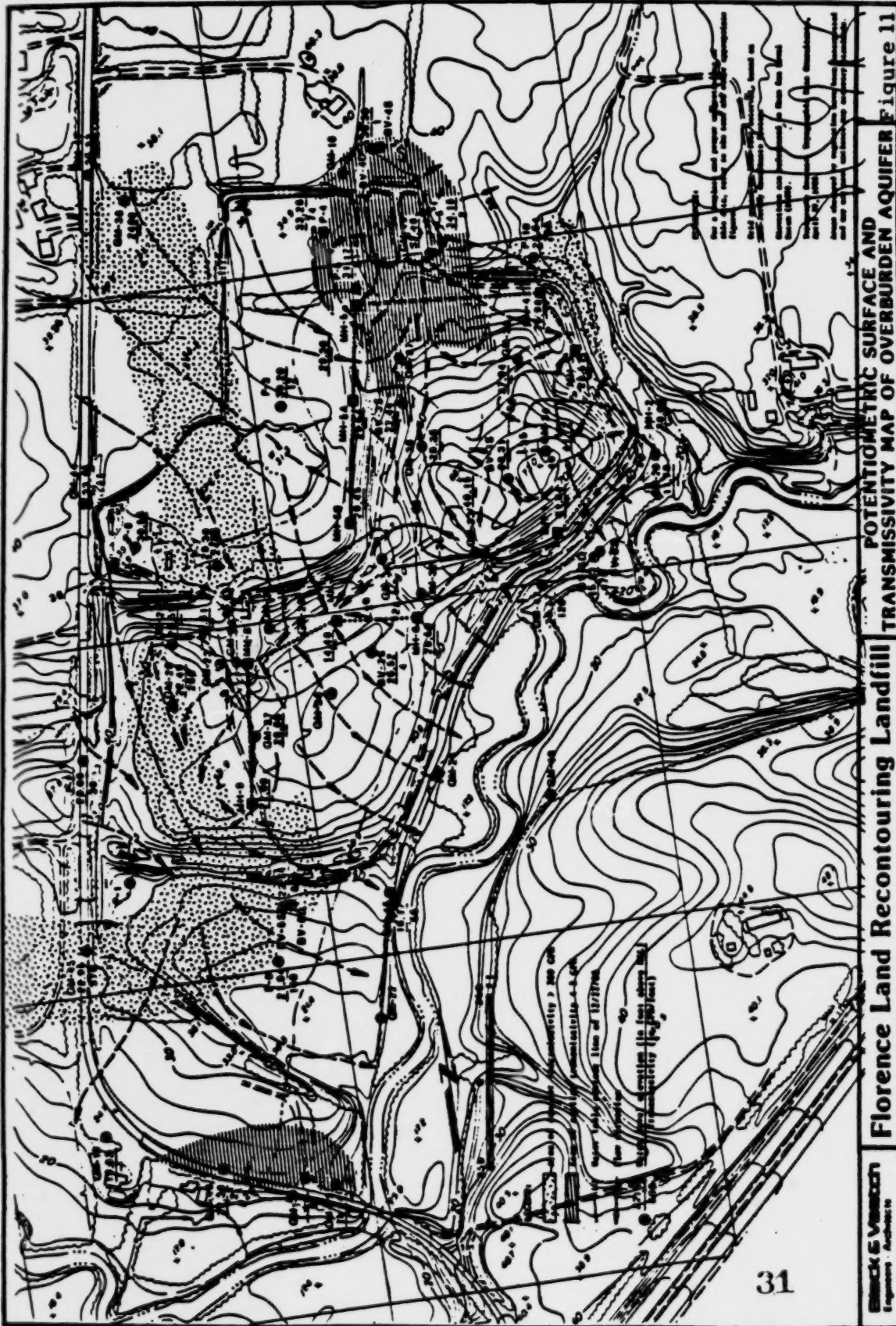
The new synthetic membrane cover system would prevent surface-water runoff contamination and significantly reduce precipitation infiltration. While the synthetic membrane system is considered to be similar in permeability to the composite synthetic membrane/clay cover system in Alternative 3 and therefore expected to permit only a small amount of infiltration, a clay layer is not incorporated as a back-up in the event of membrane breach. Consequently, this alternative is considered less reliable. The synthetic membrane cover system, coupled with an active gas extraction system, would significantly mitigate the potential for air contamination, including odors, at the site. The active gas extraction system would also promote more complete removal of the gas than a passive system.

The potential for on-site safety and health hazard exposure would be virtually eliminated by the partial fence and cover system installation, lagoon decommissioning, and active gas and leachate extraction with off-site treatment. In addition, the implementation of a long-term air and water-quality monitoring program will assist in the future evaluation of the site.

Alternative 5

Alternative 5 is similar to Alternative 4 with the addition of a partial wall and a ground-water interceptor system along the upgradient side of the landfill (see Figure 10). The cutoff wall would divert ground-water flow around the landfill, which would decrease the volume of leachate generated. From analysis of the potentiometric surface map (see Figure 11), the required limits for the partial wall were determined to extend from approximately the site entrance at Cedar Lane Extension to the area of the existing leachate lagoons. This wall would be installed at the toe of the landfill berms and extend from existing grade elevation to a minimum of three feet into the underlying Merchantville Clay layer.





POTENTIOMETRIC SURFACE AND
TRANSMISSIVITY MAP OF OVERBURDEN AQUIFER Figure 11

Florence Land Recontouring Landfill

Black & Veatch
Engineers Architects

The potential for ground-water, surface-water, and air contamination, and on-site safety and health hazard exposure would be significantly mitigated under this alternative. The installation of a partial slurry wall and upgradient ground-water interceptor would prevent and divert upgradient ground-water flow from the Pleistocene Aquifer away from the landfill. In addition, the installation of a synthetic membrane cover system would prevent surface-water runoff contamination and minimize precipitation infiltration into the landfill. It is estimated that approximately 2,000 GPD of leachate will be generated, and 1,000 GPD of ground-water flow will be induced, for a total extraction volume of 3,000 GPD. Water will be extracted from the existing manholes and new leachate extraction wells for treatment at the BCSWMFC.

In relative terms, the partial barrier wall will be somewhat less effective than the complete slurry wall in minimizing ground-water inflow and contamination, but significantly more effective than having no barrier wall. The effectiveness of the synthetic membrane cover system and the active gas extraction system is the same as described for Alternative 4. In addition, the potential for on-site safety and health hazard exposure and the effect of a long-term monitoring program is also as described in Alternative 4.

Alternative 6

Alternative 6 is similar to Alternative 5 with the addition of on-site leachate pretreatment and disposal at a POTW and on-site gas incineration rather than treatment at the Burlington County facility (see Figure 12). The leachate would be pretreated by an anaerobic biological process followed by transfer by truck to a POTW. The pretreatment would reduce the chemical oxygen demand (COD), which is a consideration for discharge to a POTW. The estimated pretreatment system design parameters would include a 3,000 GPD flow rate with influent COD of 6000 to 8000 milligrams/liter (mg/l) and an effluent COD less than 1000 mg/l. The sludges and solids from the process would be disposed off-site in an approved RCRA facility or State licensed industrial landfill, depending upon the characteristics of the sludge.

The potential for ground-water, surface-water, and air contamination, as well as on-site safety and health hazard exposure, would be significantly mitigated by Alternative 6. The effectiveness of stormwater management measures is the same as discussed for Alternative 5. Air contamination would be controlled by an active gas collection and incineration system. Although emissions would be created by the gas combustion, these are not expected to be significant or create any nuisance potential.



Ground-water contamination would be controlled by a partial barrier wall and synthetic membrane cover system, as discussed for Alternative 5, with leachate extraction and on-site pretreatment, followed by final effluent disposal at a POTW. The pretreatment facility is expected to treat the leachate to the level necessary for acceptance at a POTW, assuming that unexpected or abnormal changes do not occur over time in the leachate composition.

The potential for on-site safety and health hazard exposure would be mitigated by the installation of a fence and synthetic cover system, the decommissioning of the lagoons, and active gas extraction and flaring. Potential explosion hazards could be created by the flare units if not properly maintained. The pretreatment facility is not expected to create safety or health hazards since it would be stationary and enclosed. Adherence to standard safety and operating procedures at the site should prevent accidental mishaps.

Finally, as with Alternatives 2 through 5, the implementation of a long-term air and water-quality monitoring program will assist in early detection of contamination and future site evaluation.

Alternative 7

Alternative 7 is similar to Alternative 6 with the addition of a complete leachate treatment system which directly discharges treated effluent to the Assiscunk Creek rather than pretreatment followed by disposal at a POTW (see Figure 13). The treatment process would include anaerobic filters, followed by the activated sludge process and solids contact basins for reduction of the high concentrations of biological oxygen demand (BOD), COD, and metals. The added treatment is for the purpose of reducing the BOD to 30 mg/l and the suspended solids to 30 mg/l. Sludges generated from the treatment plant would be transported off-site for disposal.

The treatment facility has been conceptualized to treat the leachate to a degree sufficient for discharge to the Creek, based on the projected leachate quality and effluent requirements. The possibility exists, however, that the treatment process proposed will be unable to effectively treat the leachate if its quality is significantly different than expected or changes greatly over time. In addition, it should be noted that the surface-water quality in Assiscunk Creek will be impacted by the plant effluent. However, since the effluent quality will meet State requirements, the impact is expected to be minimal.

Discussion of Alternatives

The alternatives developed for FLR fulfill the National Contingency Plan requirement in that at least one alternative from each of the following groups is considered: the no-action alternative;

alternatives that do not attain applicable or relevant environmental standards but provide significant protection to public health, welfare and the environment; alternatives that exceed applicable or relevant environmental standards; alternatives that attain applicable or relevant environmental standards; and alternatives that use treatment or disposal at an off-site facility.

Alternatives 1 and 2 do not provide significant protection to public health and the environment since they allow for the release of ground water from the landfill. Hazardous substances found in the landfill have the potential to migrate into the Pleistocene Aquifer and the Assiscunk Creek under these alternatives. The remaining alternatives are designed to eliminate virtually all ground-water migration from the landfill. For this reason, they received higher evaluations than Alternatives 1 and 2 and were more likely candidates for the recommended alternative.

Alternative 3 is designed to contain the waste by allowing for a minimal amount of percolation and ground-water infiltration. An estimated 5000 gallons of leachate per month would be pumped and treated. Alternative 4 allows for a larger volume of ground water to infiltrate through the waste and, as a result, 10,000 GPD leachate would be pumped and treated. The partial wall in Alternatives 5, 6 and 7 is designed to divert most of the ground water around the landfill and reduce the amount in contact with the waste. 3000 GPD leachate would be pumped and treated.

Alternatives 4, 5, 6 and 7, which allow for some ground water/waste contact, have the potential to remove contaminants from the landfill by "flushing". However, the extent of flushing that occurs cannot be determined. Alternative 3, the full-containment option, is not a system which would encourage flushing due to the limited infiltration volumes. The wastes would remain encapsulated.

The alternatives which allow for a greater production of leachate, Alternatives 4, 5, 6 and 7, require more operation and maintenance than the full-containment option. Full containment with leachate collection would provide the most assurance for preventing leachate migration downgradient because of the physical barriers associated with it. The other alternatives all rely solely on the leachate collection system for migration prevention.

COMMUNITY RELATIONS

A public meeting was held on June 12, 1986 to present the results of the RI/FS and the recommended alternative. The RI/FS reports were distributed to the public on May 19, and the comment period extended until June 23. Responses to all public comments are included in the Responsiveness Summary in Attachment 2 of this report.

CONSISTENCY WITH OTHER ENVIRONMENTAL LAWS AND REQUIREMENTS

Compliance With RCRA

The remedial alternatives developed for FLR were designed to control the source of contamination and prevent contaminant migration. Each alternative has the goal of preventing infiltration from entering the landfill as well as preventing runoff from coming in contact with exposed waste. Two types of caps were evaluated in the Feasibility Study: a RCRA compliant cap consisting of a synthetic membrane and a clay layer; and a cap consisting of a synthetic membrane. The full-containment option includes the RCRA cap because the objective of this alternative is to produce a minimal amount of leachate and the cap provides the greatest assurance for prohibiting infiltration. The synthetic membrane will allow virtually no infiltration when it is intact. The purpose of the clay layer is to provide additional protection and reliability.

A clay layer was not included in the caps for Alternatives 4, 5, 6 and 7, which provide for partial containment of the waste. Since some ground water would continue to flow into the landfill with these alternatives, the volumes of water passing through any tears in the membrane would be insignificant and not warrant the extra protection and reliability provided by a clay layer.

In order to comply with RCRA requirements, the synthetic membrane and clay composite cap will be installed as part of the selected remedy of the FLR Landfill site.

Compliance With the National Historic Preservation Act

A Stage IA archeological study prepared for Burlington County states that there may be significant archeological sites on the FLR Landfill property. These sites may be eligible for placement on the National Register of Historic Places. The National Historic Preservation Act states that properties with archeological value must be addressed prior to a federal agency's approval of an undertaking on that land. In accordance with the requirements of this law, further archeological studies will be conducted at FLR during the remedial design process before the remedial action is implemented. Alternatives 2 through 7 will include the performance of a Stage IB archeological survey and any further archeological studies necessary to mitigate impacts on significant archeological sites prior to on-site remedial construction.

Compliance with Executive Order 11988 (Floodplain Management)

Approximately 30% of the FLR Landfill property (the southern and eastern portions of the site) lie within the 100-year floodplain as designated by the Federal Emergency Management Agency. All of the remedial alternatives, except Alternative 1, will require unavoidable encroachment on the fringe area of the floodplain. However, none of the alternatives will result in long-term adverse impacts to the floodplain or flooding levels. Short-term impacts related to construction activities associated with Alternatives 2 through 7 will be mitigated through strict adherence to appropriate engineering specifications developed during the remedial design process.

RECOMMENDED ALTERNATIVE

The National Oil and Hazardous Substances Pollution Contingency Plan in 40 CFR Part 300.68(i), specifies that the lead agency will select "... a cost-effective remedial alternative which effectively mitigates and minimizes threats to and provides adequate protection of public health, welfare, and the environment... This will require selection of a remedy that attains or exceeds applicable or relevant and appropriate Federal public health and environmental requirements that have been identified for the specific site." Evaluation of the remedial alternatives leads to the conclusion that the action described below is a cost-effective remedy at the FLR Landfill site.

The various aspects of the recommended alternative are described below along with the rationale for selection:

Three remedies for the cap were evaluated: the RCRA synthetic membrane and clay composite cap, a synthetic membrane cap, and repair of the existing cap with on-site soils. In accordance with the "CERCLA Compliance With Other Environmental Statutes" policy, a cap compliant with RCRA requirements will be constructed at the FLR Landfill. This cap will be effective in eliminating precipitation from infiltrating into the landfill and eliminating contact between surface-water runoff and the waste.

Three options for prevention of ground-water inflow were evaluated: a circumferential barrier wall; an upgradient partial barrier wall; and no barrier wall. The estimated volumes of ground-water intrusion through the circumferential wall is negligible. For the partial wall and for no wall, the volumes are 2000 GPD and 9000 GPD, respectively. The estimated cost of the full barrier wall is \$626,000, and the estimated cost of the partial wall is \$172,000.

Selection of a leachate disposal method is based on cost-effectiveness for the leachate volumes generated. Various options were identified in the alternatives. Alternative 3, which yields a minimal leachate volume, utilizes transport by truck to a POTW or the BCSWMFC. For Alternatives 4 and 5, which yield larger volumes, direct discharge to the BCSWMFC was evaluated. Alternative 6 has a volume equal to that for Alternative 5 and utilizes on-site pretreatment followed by transport to a POTW for disposal. Alternative 7 has the same volume as Alternatives 5 and 6 and utilizes on-site treatment and discharge to the Assiscunk Creek. A comparison of the costs for leachate treatment in Alternatives 5, 6 and 7 shows that disposal at the BCSWMFC is the most cost-effective method.

Alternatives 3, 4 and 5 are all designed to prevent downgradient ground-water migration. In Alternative 3, 5000 gallons of leachate per month is generated in comparison with 10,000 GPD in Alternative 4 and 3,000 GPD in Alternative 5. As a result, Alternative 3 has a small annual leachate treatment cost of \$5,300 compared to \$109,500 and \$32,900 for Alternatives 4 and 5, respectively. The circumferential wall, which is the cause for the small leachate volume, bears a capital cost of \$626,000. The partial wall in Alternative 5 has a cost of \$172,000. Installation of the circumferential wall would result in the lowest life-cycle cost, because in a finite number of years, the higher capital cost would be off-set by the lower treatment cost. Considering both the additional assurance gained with the circumferential wall and the lower life-cycle cost, it is recommended that the full wall be installed at the FLR Landfill site.

The recommended remedy for the FLR Landfill will consist of the following: a RCRA synthetic membrane and clay composite cap; new stormwater management system; circumferential barrier wall; upgradient ground-water interceptor system; leachate treatment and disposal at a POTW or the BCSWMFC; gas collection and treatment; removal of lagoons with disposal of sediments on-site before landfill is capped; disposal of on-site trailer and miscellaneous debris at an appropriate off-site landfill; and installation of a partial fence with warning signs. Leachate treatability studies will be conducted during design. The costs for this alternative are summarized in Table 3.

In addition, supplemental sampling will be conducted during design of the selected remedy. The reason for this action is twofold: significant outstanding concerns expressed by citizens regarding potable water quality at the June 12, 1986 public meeting and development of a more comprehensive data base of existing off-site ground-water quality prior to the installation of the BCSWMFC. This program will include sampling ground water from the existing monitoring wells, new monitoring wells, if necessary, and area potable wells. Surface water and sediment samples will also be obtained from the Assiscunk Creek.

TABLE 3

DETAILED COSTS OF RECOMMENDED ALTERNATIVE

CAPITAL COST SUMMARY

Mobilization	\$ 563,000
Circumferential barrier wall with upgradient ground water interceptor	626,000
Leachate collection system refurbishing and lagoon decommissioning	55,000
Composite synthetic membrane/clay cover system	4,853,000
Gas collection and treatment system	111,000
Monitoring wells	23,000
Miscellaneous site improvements	117,000
Subtotal	\$6,348,000
Contingencies (15%)	952,000
Engineering and Administration	721,000
Total	\$8,021,000

Operation and Maintenance Cost Summary

	<u>Annual O&M Cost (\$/YR)</u>
Leachate collection	\$ 2,500
Leachate transport and disposal at POTW or BCSWMFC	5,300
Gas treatment	33,000
Cap and drainage structure maintenance	80,000
Monitoring	48,000
Miscellaneous O&M	1,200
Total	\$ 170,000

Total Present Worth Cost = \$9,270,000

OPERATION AND MAINTENANCE

Operation and Maintenance (O&M) of the site will include long-term collection and treatment of the gas and leachate. In addition, long-term monitoring and maintenance of the cap and drainage structures will be required. The monitoring program will include sampling of ground water, surface water, sediments, and air. The O&M cost is estimated to be \$170,000 annually. O&M will be funded as specified in CERCLA and the NCP.

SCHEDULE

<u>Project Milestone</u>	<u>Date</u>
- Approve Remedial Action	June 1986
- Complete Enforcement Negotiations	December 1986
- Amend Cooperative Agreement for Design	Pending CERCLA Reauthorization or State Funding
- Initiate Design	Pending CERCLA Reauthorization or State Funding
- Complete Design	Pending CERCLA Reauthorization or State Funding

ATTACHMENT 1

Analytical Data

CONSTITUENT	ALUMINUM WELLS										IRON-CEMENT WELLS										RELATIVE WATER STRESS ON CHIVILLA										
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409		0410	0411	0412	0413	0414	0415	0416	0417	0418	
VOLATILE COMPOUNDS																															
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
NITROGEN COMPOUNDS																															
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
SULFUR COMPOUNDS																															
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
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	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
PETROLEUM																															
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
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CONCENTRATIONS																															
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CYANIDE																															
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
SULFATE ON SO4																															
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
SPECIFIC CONDUCTANCE																															
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
SPECIFIC CONDUCTANCE																															
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
PH																															
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228	0404	0405	0407-42	0409-48	0410	0411	0412	0414	0416	0417	04229	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418		
	04170	04119	04228																												

NOTE: Blank scores converted to zero and not detected.

INFL - Inlet outlet detection float.

Not available.

20 - Some data for this sample has been recalled - refer to Appendix B.

Table 1

CONSTITUENT	UNITS	4-82	4-85	4-88	DRINKING WATER STANDARD OR CRITERIA
VOLATILE COMPOUNDS					
1,2-Dichloroethane	ug/l	13.9			8.94
Methylene chloride	ug/l	24.5	18.4	28.0	150
1,1,2-Trichloroethane	ug/l	43.8			8.6
Trichloroethylene	ug/l	BDEL			2.7
BASE/NEUTRAL COMPOUNDS					
Acenaphthene	ug/l			4.81	NA
Anthracene	ug/l			BDEL	NA
bis(2-Ethylhexyl)anthalate	ug/l			BDEL	15000
1,4-Dichlorobenzene	ug/l			BDEL	400
Fluoranthene	ug/l			9.93	42
Fluorene	ug/l			5.58	NA
Naphthalene	ug/l			21.2	NA
Phenanthrene	ug/l			16.7	NA
Pyrene	ug/l			5.63	NA
METALS					
Antimony	ug/l			BDEL	146
Copper	ug/l			BDEL	1000
Nickel	ug/l			BDEL	12.4
Thallium	ug/l	BDEL			13
Zinc	ug/l			100	5000
CONVENTIONAL PARAMETERS					
Chloride	mg/l	67.2	14.6	141	250
Sulfate as SO4	mg/l	97	320	160	250
Specific Conductance	um/cm	1384	844	1571	NA
Specific Conductance	um/cm	1083	832	1512	NA
pH	std	6.6	6.4	7.1	6.5-8.5
pH	std	6.7	6.4	7.2	6.5-8.5
Ammonia as N	mg/l	19	8.25	54	NA
Chemical Oxygen Demand (COD)	mg/l	70	6	91	NA
Hardness as CaCO3	mg/l	630	550	510	NA
Iron	ug/l	3200	1000	34900	300
Manganese	ug/l	130	60	390	50

NOTES: Blank spaces correspond to parameters not detected.

BDEL - Below method detection limit.

NA - Not available.

SUMMARY OF LEACHATE MANHOLE ANALYSES

Table 3

[illegible]

NOTES: Blank scans converted to normal and detected.
PDA - Blind method detection limit.
NA - Not available.

Table 3 (continued)

NOTES: Mark scores correspond to parameters not detected.
PQL - below method detection limit.
nd - not available.

WESTON (602)
800-343-2323
704-371-7204

RESULTS

Call Now
760.113.3463

Chloride
 Sulfate as SO₄
 Specific Conductivity
 Specific Conductivity
 pH
 pH
 Ammonia as N
 Chemical Oxygen Demand
 Hardness as CaCO₃
 Iron
 Resuspension

CONTACT | 1-855-4

POSTAGE WILL BE PAID BY ADDRESSEE

- Bromine
 Chloroform
 Ethylmagnesium
 Nitrobenzene
 Tetrahydrofuran
 Toluene
 1,2-Dichloroethane
 1,1,1-Trichloroethane
 Trichloroethylene

RESEARCH DESIGN

Product/Service:

INDEX

1

- [illegible]

DECLASSIFIED

NOTES: Spaces converted to underscores and deleted.

1993 - Rules without detection limit.

00 - How often for this sample has been qualified - refer to Appendix E.

Table 4

UNIT NO. ALL				ALBUQUERQUE FURNITURE										KENDALLVILLE FURNITURE										UNIT TYPE - CATEGORY PERCENT DATA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
001-01	001-02	002-01	002-02	003-01	003-02	004-01	004-02	005-01	005-02	006-01	006-02	007-01	007-02	008-01	008-02	009-01	009-02	010-01	010-02	011-01	011-02	012-01	012-02	013-01	013-02	014-01	014-02	015-01	015-02	016-01	016-02	017-01	017-02	018-01	018-02	019-01	019-02	020-01	020-02	021-01	021-02	022-01	022-02	023-01	023-02	024-01	024-02	025-01	025-02	026-01	026-02	027-01	027-02	028-01	028-02	029-01	029-02	030-01	030-02	031-01	031-02	032-01	032-02	033-01	033-02	034-01	034-02	035-01	035-02	036-01	036-02	037-01	037-02	038-01	038-02	039-01	039-02	040-01	040-02	041-01	041-02	042-01	042-02	043-01	043-02	044-01	044-02	045-01	045-02	046-01	046-02	047-01	047-02	048-01	048-02	049-01	049-02	050-01	050-02	051-01	051-02	052-01	052-02	053-01	053-02	054-01	054-02	055-01	055-02	056-01	056-02	057-01	057-02	058-01	058-02	059-01	059-02	060-01	060-02	061-01	061-02	062-01	062-02	063-01	063-02	064-01	064-02	065-01	065-02	066-01	066-02	067-01	067-02	068-01	068-02	069-01	069-02	070-01	070-02	071-01	071-02	072-01	072-02	073-01	073-02	074-01	074-02	075-01	075-02	076-01	076-02	077-01	077-02	078-01	078-02	079-01	079-02	080-01	080-02	081-01	081-02	082-01	082-02	083-01	083-02	084-01	084-02	085-01	085-02	086-01	086-02	087-01	087-02	088-01	088-02	089-01	089-02	090-01	090-02	091-01	091-02	092-01	092-02	093-01	093-02	094-01	094-02	095-01	095-02	096-01	096-02	097-01	097-02	098-01	098-02	099-01	099-02	100-01	100-02	101-01	101-02	102-01	102-02	103-01	103-02	104-01	104-02	105-01	105-02	106-01	106-02	107-01	107-02	108-01	108-02	109-01	109-02	110-01	110-02	111-01	111-02	112-01	112-02	113-01	113-02	114-01	114-02	115-01	115-02	116-01	116-02	117-01	117-02	118-01	118-02	119-01	119-02	120-01	120-02	121-01	121-02	122-01	122-02	123-01	123-02	124-01	124-02	125-01	125-02	126-01	126-02	127-01	127-02	128-01	128-02	129-01	129-02	130-01	130-02	131-01	131-02	132-01	132-02	133-01	133-02	134-01	134-02	135-01	135-02	136-01	136-02	137-01	137-02	138-01	138-02	139-01	139-02	140-01	140-02	141-01	141-02	142-01	142-02	143-01	143-02	144-01	144-02	145-01	145-02	146-01	146-02	147-01	147-02	148-01	148-02	149-01	149-02	150-01	150-02	151-01	151-02	152-01	152-02	153-01	153-02	154-01	154-02	155-01	155-02	156-01	156-02	157-01	157-02	158-01	158-02	159-01	159-02	160-01	160-02	161-01	161-02	162-01	162-02	163-01	163-02	164-01	164-02	165-01	165-02	166-01	166-02	167-01	167-02	168-01	168-02	169-01	169-02	170-01	170-02	171-01	171-02	172-01	172-02	173-01	173-02	174-01	174-02	175-01	175-02	176-01	176-02	177-01	177-02	178-01	178-02	179-01	179-02	180-01	180-02	181-01	181-02	182-01	182-02	183-01	183-02	184-01	184-02	185-01	185-02	186-01	186-02	187-01	187-02	188-01	188-02	189-01	189-02	190-01	190-02	191-01	191-02	192-01	192-02	193-01	193-02	194-01	194-02	195-01	195-02	196-01	196-02	197-01	197-02	198-01	198-02	199-01	199-02	200-01	200-02	201-01	201-02	202-01	202-02	203-01	203-02	204-01	204-02	205-01	205-02	206-01	206-02	207-01	207-02	208-01	208-02	209-01	209-02	210-01	210-02	211-01	211-02	212-01	212-02	213-01	213-02	214-01	214-02	215-01	215-02	216-01	216-02	217-01	217-02	218-01	218-02	219-01	219-02	220-01	220-02	221-01	221-02	222-01	222-02	223-01	223-02	224-01	224-02	225-01	225-02	226-01	226-02	227-01	227-02	228-01	228-02	229-01	229-02	230-01	230-02	231-01	231-02	232-01	232-02	233-01	233-02	234-01	234-02	235-01	235-02	236-01	236-02	237-01	237-02	238-01	238-02	239-01	239-02	240-01	240-02	241-01	241-02	242-01	242-02	243-01	243-02	244-01	244-02	245-01	245-02	246-01	246-02	247-01	247-02	248-01	248-02	249-01	249-02	250-01	250-02	251-01	251-02	252-01	252-02	253-01	253-02	254-01	254-02	255-01	255-02	256-01	256-02	257-01	257-02	258-01	258-02	259-01	259-02	260-01	260-02	261-01	261-02	262-01	262-02	263-01	263-02	264-01	264-02	265-01	265-02	266-01	266-02	267-01	267-02	268-01	268-02	269-01	269-02	270-01	270-02	271-01	271-02	272-01	272-02	273-01	273-02	274-01	274-02	275-01	275-02	276-01	276-02	277-01	277-02	278-01	278-02	279-01	279-02	280-01	280-02	281-01	281-02	282-01	282-02	283-01	283-02	284-01	284-02	285-01	285-02	286-01	286-02	287-01	287-02	288-01	288-02	289-01	289-02	290-01	290-02	291-01	291-02	292-01	292-02	293-01	293-02	294-01	294-02	295-01	295-02	296-01	296-02	297-01	297-02	298-01	298-02	299-01	299-02	300-01	300-02	301-01	301-02	302-01	302-02	303-01	303-02	304-01	304-02	305-01	305-02	306-01	306-02	307-01	307-02	308-01	308-02	309-01	309-02	310-01	310-02	311-01	311-02	312-01	312-02	313-01	313-02	314-01	314-02	315-01	315-02	316-01	316-02	317-01	317-02	318-01	318-02	319-01	319-02	320-01	320-02	321-01	321-02	322-01	322-02	323-01	323-02	324-01	324-02	325-01	325-02	326-01	326-02	327-01	327-02	328-01	328-02	329-01	329-02	330-01	330-02	331-01	331-02	332-01	332-02	333-01	333-02	334-01	334-02	335-01	335-02	336-01	336-02	337-01	337-02	338-01	338-02	339-01	339-02	340-01	340-02	341-01	341-02	342-01	342-02	343-01	343-02	344-01	344-02	345-01	345-02	346-01	346-02	347-01	347-02	348-01	348-02	349-01	349-02	350-01	350-02	351-01	351-02	352-01	352-02	353-01	353-02	354-01	354-02	355-01	355-02	356-01	356-02	357-01	357-02	358-01	358-02	359-01	359-02	360-01	360-02	361-01	361-02	362-01	362-02	363-01	363-02	364-01	364-02	365-01	365-02	366-01	366-02	367-01	367-02	368-01	368-02	369-01	369-02	370-01	370-02	371-01	371-02	372-01	372-02	373-01	373-02	374-01	374-02	375-01	375-02	376-01	376-02	377-01	377-02	378-01	378-02	379-01	379-02	380-01	380-02	381-01	381-02	382-01	382-02	383-01	383-02	384-01	384-02	385-01	385-02	386-01	386-02	387-01	387-02	388-01	388-02	389-01	389-02	390-01	390-02	391-01	391-02	392-01	392-02	393-01	393-02	394-01	394-02	395-01	395-02	396-01	396-02	397-01	397-02	398-01	398-02	399-01	399-02	400-01	400-02	401-01	401-02	402-01	402-02	403-01	403-02	404-01	404-02	405-01	405-02	406-01	406-02	407-01	407-02	408-01	408-02	409-01	409-02	410-01	410-02	411-01	411-02	412-01	412-02	413-01	413-02	414-01	414-02	415-01	415-02	416-01	416-02	417-01	417-02	418-01	418-02	419-01	419-02	420-01	420-02	421-01	421-02	422-01	422-02	423-01	423-02	424-01	424-02	425-01	425-02	426-01	426-02	427-01	427-02	428-01	428-02	429-01	429-02	430-01	430-02	431-01	431-02	432-01	432-02	433-01	433-02	434-01	434-02	435-01	435-02	436-01	436-02	437-01	437-02	438-01	438-02	439-01	439-02	440-01	440-02	441-01	441-02	442-01	442-02	443-01	443-02	444-01	444-02	445-01	445-02	446-01	446-02	447-01	447-02	448-01	448-02	449-01	449-02	450-01	450-02	451-01	451-02	452-01	452-02	453-01	453-02	454-01	454-02	455-01	455-02	456-01	456-02	457-01	457-02	458-01	458-02	459-01	459-02	460-01	460-02	461-01	461-02	462-01	462-02	463-01	463-02	464-01	464-02	465-01	465-02	466-01	466-02	467-01	467-02	468-01	468-02	469-01	469-02	470-01	470-02	471-01	471-02	472-01	472-02	473-01	473-02	474-01	474-02	475-01	475-02	476-01	476-02	477-01	477-02	478-01	478-02	479-01	479-02	480-01	480-02	481-01	481-02	482-01	482-02	483-01	483-02	484-01	484-02	485-01	485-02	486-01	486-02	487-01	487-02	488-01	488-02	489-01	489-02	490-01	490-02	491-01	491-02	492-01	492-02	493-01	493-02	494-01	494-02	495-01	495-02	496-01	496-02	497-01	497-02	498-01	498-02	499-01	499-02	500-01	500-02	501-01	501-02	502-01	502-02	503-01	503-02	504-01	504-02	505-01	505-02	506-01	506-02	507-01	507-02	508-01	508-02	509-01	509-02	510-01	510-02	511-01	511-02	512-01	512-02	513-01	513-02	514-01	514-02	515-01	515-02	516-01	516-02	517-01	517-02	518-01	518-02	519-01	519-02	520-01	520-02	521-01	521-02	522-01	522-02	523-01	523-02	524-01	524-02	525-01	525-02	526-01	526-02	527-01	527-02	528-01	528-02	529-01	529-02	530-01	530-02	531-01	531-02	532-01	532-02	533-01	533-02	534-01	534-02	535-01	535-02	536-01	536-02	537-01	537-02	538-01	538-02	539-01	539-02	540-01	540-02	541-01	541-02	542-01	542-02	543-01	543-02	544-01	544-02	545-01	545-02	546-01	546-02	547-01	547-02	548-01	548-02	549-01	549-02	550-01	550-02	551-01	551-02	552-01	552-02	553-01	553-02	554-01	554-02	555-01	555-02	556-01	556-02	557-01	557-02	558-01	558-02	559-01	559-02	560-01	560

UNIT 11 - FALL										ALUMINUM FORMATION										RECONSTRUCTION FORMATION										UNIT 11 - SPRING																																																																																					
DATE	TIME	LOC	10-12	12-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120	120-125	125-130	130-135	135-140	140-145	145-150	150-155	155-160	160-165	165-170	170-175	175-180	180-185	185-190	190-195	195-200	200-205	205-210	210-215	215-220	220-225	225-230	230-235	235-240	240-245	245-250	250-255	255-260	260-265	265-270	270-275	275-280	280-285	285-290	290-295	295-300	300-305	305-310	310-315	315-320	320-325	325-330	330-335	335-340	340-345	345-350	350-355	355-360	360-365	365-370	370-375	375-380	380-385	385-390	390-395	395-400	400-405	405-410	410-415	415-420	420-425	425-430	430-435	435-440	440-445	445-450	450-455	455-460	460-465	465-470	470-475	475-480	480-485	485-490	490-495	495-500	500-505	505-510	510-515	515-520	520-525	525-530	530-535	535-540	540-545	545-550	550-555	555-560	560-565	565-570	570-575
10-12	12-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120	120-125	125-130	130-135	135-140	140-145	145-150	150-155	155-160	160-165	165-170	170-175	175-180	180-185	185-190	190-195	195-200	200-205	205-210	210-215	215-220	220-225	225-230	230-235	235-240	240-245	245-250	250-255	255-260	260-265	265-270	270-275	275-280	280-285	285-290	290-295	295-300	300-305	305-310	310-315	315-320	320-325	325-330	330-335	335-340	340-345	345-350	350-355	355-360	360-365	365-370	370-375	375-380	380-385	385-390	390-395	395-400	400-405	405-410	410-415	415-420	420-425	425-430	430-435	435-440	440-445	445-450	450-455	455-460	460-465	465-470	470-475	475-480	480-485	485-490	490-495	495-500	500-505	505-510	510-515	515-520	520-525	525-530	530-535	535-540	540-545	545-550	550-555	555-560	560-565	565-570	570-575			
10-12	12-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120	120-125	125-130	130-135	135-140	140-145	145-150	150-155	155-160	160-165	165-170	170-175	175-180	180-185	185-190	190-195	195-200	200-205	205-210	210-215	215-220	220-225	225-230	230-235	235-240	240-245	245-250	250-255	255-260	260-265	265-270	270-275	275-280	280-285	285-290	290-295	295-300	300-305	305-310	310-315	315-320	320-325	325-330	330-335	335-340	340-345	345-350	350-355	355-360	360-365	365-370	370-375	375-380	380-385	385-390	390-395	395-400	400-405	405-410	410-415	415-420	420-425	425-430	430-435	435-440	440-445	445-450	450-455	455-460	460-465	465-470	470-475	475-480	480-485	485-490	490-495	495-500	500-505	505-510	510-515	515-520	520-525	525-530	530-535	535-540	540-545	545-550	550-555	555-560	560-565	565-570	570-575			
10-12	12-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120	120-125	125-130	130-135	135-140	140-145	145-150	150-155	155-160	160-165	165-170	170-175	175-180	180-185	185-190	190-195	195-200	200-205	205-210	210-215	215-220	220-225	225-230	230-235	235-240	240-245	245-250	250-255	255-260	260-265	265-270	270-275	275-280	280-285	285-290	290-295	295-300	300-305	305-310	310-315	315-320	320-325	325-330	330-335	335-340	340-345	345-350	350-355	355-360	360-365	365-370	370-375	375-380	380-385	385-390	390-395	395-400	400-405	405-410	410-415	415-420	420-425	425-430	430-435	435-440	440-445	445-450	450-455	455-460	460-465	465-470	470-475	475-480	480-485	485-490	490-495	495-500	500-505	505-510	510-515	515-520	520-525	525-530	530-535	535-540	540-545	545-550	550-555	555-560	560-565	565-570	570-575			
10-12	12-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120	120-125	125-130	130-135	135-140	140-145	145-150	150-155	155-160	160-165	165-170	170-175	175-180	180-185	185-190	190-195	195-200	200-205	205-210	210-215	215-220	220-225	225-230	230-235	235-240	240-245	245-250	250-255	255-260	260-265	265-270	270-275	275-280	280-285	285-290	290-295	295-300	300-305	305-310	310-315	315-320	320-325	325-330	330-335	335-340	340-345	345-350	350-355	355-360	360-365	365-370	370-375	375-380	380-385	385-390	390-395	395-400	400-405	405-410	410-415	415-420	420-425	425-430	430-435	435-440	440-445	445-450	450-455	455-460	460-465	465-470	470-475	475-480	480-485	485-490	490-495	495-500	500-505	505-510	510-515	515-520	520-525	525-530	530-535	535-540	540-545	545-550	550-555	555-560	560-565	565-570	570-575			
10-12	12-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120	120-125	125-130	130-135	135-140	140-145	145-150	150-155	155-160	160-165	165-170	170-175	175-180	180-185	185-190	190-195	195-200	200-205	205-210	210-215	215-220	220-225	225-230	230-235	235-240	240-245	245-250	250-255	255-260	260-265	265-270	270-275	275-280	280-285	285-290	290-295	295-300	300-305	305-310	310-315	315-320	320-325	325-330	330-335	335-340	340-345	345-350	350-355	355-360	360-365	365-370	370-375	375-380	380-385	385-390	390-395	395-400	400-405	405-410	410-415	415-420	420-425	425-430	430-435	435-440	440-445	445-450	450-455	455-460	460-465	465-470	470-475	475-480	480-485	485-490	490-495	495-500	500-505	505-510	510-515	515-520	520-525	525-530	530-535	535-540	540-545	545-550	550-555	555-560	560-565	565-570	570-575			
10-12	12-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120	120-125	125-130	130-135	135-140	140-145	145-150	150-155	155-160	160-165	165-170	170-175	175-180	180-185	185-190	190-195	195-200	200-205	205-210	210-215	215-220	220-225	225-230	230-235	235-240	240-245	245-250	250-255	255-260	260-265	265-270	270-275	275-280	280-285	285-290	290-295	295-300	300-305	305-310	310-315	315-320	320-325	325-330	330-335	335-340	340-345	345-350	350-355	355-360	360-365	365-370	370-375	375-380	380-385	385-390	390-395	395-400	400-405	405-410	410-415	415-420	420-425	425-430	430-435	435-440	440-445	445-450	450-455	455-460	460-465	465-470	470-475	475-480	480-485	485-490	490-495	495-500	500-505	505-510	510-515	515-520	520-525	525-530	530-535	535-540	540-545	545-550	550-555	555-560	560-565	565-570	570-575			
10-12	12-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120	120-125	125-130	130-135	135-140	140-145	145-150	150-155	155-160	160-165	165-170	170-175	175-180	180-185	185-190	190-195	195-200	200-205	205-210	210-215	215-220	220-225	225-230	230-235	235-240	240-245	245-250	250-255	255-260	260-265	265-270	270-275	275-280	280-285	285-290	290-295	295-300	300-305	305-310	310-315	315-320	320-325	325-330	330-335	335-340	340-345	345-350	350-355	355-360	360-365	365-370	370-375	375-380	380-385	385-390	390-395	395-400	400-405	405-410	410-415	415-420	420-425	425-430	430-435	435-440	440-445	445-450	450-455	455-460	460-465	465-470	470-475	475-480	480-485	485-490	490-495	495-500	500-505	505-510	510-515	515-520	520-525	525-530	530-535	535-540	540-545	545-550	550-555	555-560	560-565	565-570	570-575			
10-12	12-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120	120-125	125-130	130-135	135-140	140-145	145-150	150-155	155-160	160-165	165-170	170-175	175-180	180-185	185-190	190-195	195-200	200-205	205-210	210-215	215-220	220-225	225-230	230-235	235-240	240-245	245-250	250-255	255-260	260-265	265-270	270-275	275-280	280-285	285-290	290-295	295-300	300-305	305-310	310-315	315-320	320-325	325-330	330-335	335-340	340-345	345-350	350-355	355-360	360-365	365-370	370-375	375-380	380-385	385-390	390-395	395-400	400-405	405-410	410-415	415-420	420-425	425-430	430-435	435-440	440-445	445-450	450-455	455-460	460-465	465-470	470-475	475-480	480-485	485-490	490-495	495-500	500-505	505-510	510-515	515-520	520-525	525-530	530-535	535-540	540-545	545-550	550-555	555-560	560-565	565-570	570-575			
10-12	12-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120	120-125	125-130	130-135	135-140	140-145	145-150	150-155	155-160	160-165	165-170	170-175	175-180																																																																																		

CONSTITUENT	UNITS	SU-01	SU-02	SU-03-01	SU-03-02	SU-04	SU-07	DRINKING WATER STANDARD OR CRITERIA
VOLATILE COMPOUNDS								
Methylene chloride	ug/l	5.00	5.60	15.4	7.40	5.60	20.0	150
ACID COMPOUNDS								
Pentachlorophenol	ug/l					28.2	9.42	10:0
Phenol	ug/l					9.10	16.5	3500
METALS								
Arsenic	ug/l		MDL	MDL				50
Copper	ug/l					MDL		1000
Lead	ug/l	MDL			MDL	MDL		50
Zinc	ug/l		MDL	MDL		60		5000
Cyanide, Total	ug/l	(25	(25	(25	(25	(25	(25	200
Phenolics, Total	ug/l	(50	(50	(50	(50	(50	(50	NA
CONVENTIONAL PARAMETERS								
Chloride	ug/l	27	43	25	29	35	30	250
Sulfate as SO ₄	ug/l	35	35	30	28	39	33	250
Specific Conductance	um/cm	160	160	120	120	330	166	NA
Specific Conductance	um/cm	160	170	130	120	340	171	NA
pH	std	6.4	7.1	7.0	6.2	7	7.1	6.5-8.5
pH	std	6.4	7.1	7.0	6.2	7	7.1	6.5-8.5
Ammonia as N	ug/l	0.05	0.05	(0.05	(0.05	0.22	0.06	NA
Chemical Oxygen Demand (COD)	ug/l	14	11	14	27	32	13	NA
Hardness as CaCO ₃	ug/l	53	53	30	37	120	53	NA
Iron	ug/l	800000	700	800	800	1000	700	300
Manganese	ug/l	160000	140	40	40	750	140	50
QUALIFIED DATA								
			GD		GD			

NOTES: Spaces correspond to parameters not detected.

MDL - Belem method detection limit.

NA - Not available.

GD - Some data for this sample has been qualified - refer to Appendix B.

SUMMARY OF SURFACE-WATER ANALYSES:

Black & Veatch
Engineers - Architects

Florence Land Recontouring Landfill

Table 5

ATTACHMENT 2

Responsiveness Summary

RESPONSIVENESS SUMMARY:

Completion of Feasibility Study
Florence Land Recontouring, Inc. Landfill
Florence, Mansfield and Springfield Townships
Burlington County
New Jersey

**Responsiveness Summary:
Completion of Feasibility Study
Florence Land Recontouring Landfill, Inc.
Florence, Mansfield and Springfield Townships**

A public meeting was held by the New Jersey Department of Environmental Protection (NJDEP) on May 2, 1985 to discuss the initiation of the Remedial Investigation/Feasibility Study (RI/FS) for the Florence Land Recontouring, Inc. Landfill (FLR) site. Notification of the meeting was accomplished through press releases sent to all newspapers listed in the FLR Community Relations Plan and mailings to all parties listed in the "Contacts" section of the plan. An information package including an agenda, fact sheet, glossary of terms, overview of the community relations program at Superfund hazardous waste sites, site maps and the steps involved in a major hazardous waste site cleanup was given to all attendees at the beginning of the meeting (see Attachment A). The meeting was attended by approximately 40 people in addition to the local officials, NJDEP representatives and USEPA representatives. (See Attachment B). After the initial presentation by NJDEP's contractor, Black and Veatch Engineers-Architects, the meeting was opened for discussion.

A second public meeting was held by NJDEP on June 12, 1986 to discuss the results of the RI/FS at the FLR site. Notification of the meeting was accomplished through press releases sent to all newspapers listed in the FLR Community Relations Plan and mailings to all parties listed in the "Contacts" section of the plan and on the attendance sheet from the May 2, 1985 public meeting. An information package including the agenda, fact sheet, glossary of terms, overview of the Superfund community relations program, and the steps in a major site cleanup was handed out to all attendees at the beginning of the meeting (see Attachment C). Approximately 90 people attended (see Attachment D).

The contractor, Black & Veatch Consulting Engineers, discussed the results of the RI/FS and the remedial action alternatives for long-term site remediation. NJDEP then presented its recommended alternative.

The draft RI/FS was made available for public review and comment, beginning on May 19, 1986, at six repositories: The Florence, Mansfield and Springfield Township Municipal Buildings, the Florence Township Library, the Burlington County Library in Mount Holly, and the NJDEP Division of Hazardous Site Mitigation in Trenton. The comment period closed on June 23, 1986.

Following is a summary of the major verbal and written questions and comments with NJDEP's and USEPA's responses:

RESPONSIVENESS SUMMARY

Verbal Comments

Issue: Well #4 is not a true upgradient well. They are impacted by lagoons. How were upgradient aquifer conditions assessed?

Answer: Based on the results of the RI, NJDEP and USEPA have concluded that well BV - 4S is not a true upgradient well. This may be a result of local impact on the upper (Pleistocene) aquifer from the lagoons or spillage which has occurred during leachate removal from the lagoons. However, the upgradient water quality conditions could be assessed by the upgradient potable wells. This information will be augmented by the upgradient wells installed as part of the supplemental sampling program.

Issue: This landfill is only 13 years old and relatively young. As such, there has been insufficient time for the leachate to migrate. The Townships are not convinced that FLR is not contributing to the water problems being experienced in the area. In the past year and a half, the community has utilized three different laboratories as well as NJDEP and USEPA and we see different contaminants popping up. Black and Veatch (B&V) and NJDEP knew that in addition to the RI/FS, residents wanted the problem of ground water contamination addressed. Data collected to date has indicated random, not persistent, pollution.

The selected alternative will mitigate any future release of contamination from the FLR landfill. The circumferential barrier wall, composite cap and subsequent leachate extraction will minimize the hydraulic pressures which cause contaminant migration. Public comment was considered in the design of the RI/FS sampling program. The sampling indicated that all drinking water criteria had been met. The two organic contaminants that were detected at trace levels were methylene chloride and bis(2-ethylhexyl) phthalate. With regard to the methylene chloride, it has been detected in ten of the 21 homes sampled. However, in all instances (except for DW-09) it was also detected in corresponding trip and field blanks (Quality Control Samples). For DW-09, a duplicate of this sample was analyzed and methylene chloride could not be detected. Bis(2-ethylhexyl) phthalate was detected in three domestic wells as follows: at below method detection limits (BMDL) in two wells and at 16.0 parts per billion (ppb) in one well. However, the corresponding trip blank contained 80.0 ppb of this contaminant. Therefore bis(2-ethylhexyl) phthalate and methylene chloride are believed to be laboratory introduced for the potable well samples.

Issue: We are not sure if the wells were sampled correctly. With regards to exceeded holding times, Section 10 of the RI has the biggest disclaimer we've ever seen. The FS neglects analysis of contaminants that may have escaped from the landfill already.

Answer: All potable wells were sampled in accordance with acceptable NJDEP sampling procedures under supervision of a NJDEP representative. The first round of analyses indicated that the laboratory had exceeded

holding times for the volatile organic analysis by six to seven days. As a result, affected wells were resampled and analyzed for the volatile organic fraction only. The results of these latter analyses passed the NJDEP Quality Assurance review without qualification. However, as with previous analyses, methylene chloride was detected in these samples and in the trip blank. It is believed that this contaminant was laboratory introduced throughout the course of the project, however supplemental sampling will be conducted to address the presence of these low levels of contaminants found in the potable well samples. This supplemental sampling will include existing monitoring wells, newly-installed monitoring wells, a selection of local potable wells and surface/sediment samples from the Assiscunk Creek. A long-term monitoring program will also be implemented as part of the selected alternative.

Issue: Statements in the RI report are inconsistent regarding the integrity of the Merchantville Clay. It is stated that the Merchantville is impermeable, but also suggested that it is not. We know clay layers may seem to have low permeability and appear continuous, but in nature clay can fracture and deviate in thickness. The analysis in the RI did not indicate any connection between the shallow and deeper aquifer. That analysis should be completed.

Answer: The RI did not state that the Merchantville Clay was impermeable, but that it serves to retard the migration of contamination. The permeability of the Merchantville was measured to be between 10^{-5} centimeters per second (cm/sec) and 10^{-7} cm/sec. At this rate, ground water in the surface aquifer could migrate through the clay and reach the Raritan-Magothy in 24 years. Pump tests performed in the Raritan-Magothy showed no direct hydraulic connection between this aquifer and the surface aquifer. The recommended alternative will not only minimize the production of leachate, but will extract any remaining liquid from the landfill and relieve the hydraulic pressures which would drive the leachate through the clay in the 24 year period. This is expected to substantially reduce the potential for contaminant migration.

Issue: We know about serious problems in Mansfield with regard to high cancer rates and contaminated water. We are disappointed with the B&V ground water flow reports. We feel that they are inaccurate. We were instrumental in getting the site on the National Priorities List. We went to Washington D.C. to meet with William Hedeman and Chris Smith and were told that the RI would include an investigation of potable wells. At the May 1985 public meeting this was again expressed. We question whether potable sampling was done. Residents that were listed as being sampled say they were not sampled.

Answer: A potable well sampling program was implemented as part of the RI. The selection of the 20 locations were based on the following criteria:

- 1) Coordination with respect to survey results of the incidence of cancer on Hedding-Jacksonville Road (at the request of Dorothy Wirth, Chairperson, FLR Citizen's Advisory Committee [FLRCAC]).

- 2) Use of locations with an existing data base. This focused on the wells sampled by Geraghty and Miller in 1982.
- 3) A representative cross section of wells upgradient and downgradient of the landfill.

The daily sampling logs are available upon request.

In addition to the potable wells sampled during the RI, USEPA sampled 13 potable wells in Mansfield Township in August 1985.

Issue: We know there is no source, other than FLR, for the ground water contamination in the area. We question your analyses. The RI report stated that there were quality assurance problems with the data.

Answer: The potable well data from the RI/FS does not show any contamination in drinking water supplies which can be attributed to the FLR landfill. As stated in an earlier response, detected contaminants are suspected of being laboratory introduced. The resampling of select potable wells is expected to clarify this issue. It is possible that there are other sources of potential ground water contamination in the area. All potable wells which had quality assurance problems were resampled. The references to qualified data for potable well samples is incorrect and the final RI report will reflect the correct results. Out of ninety-two samples taken during the FLR RI, eighteen pieces of data were qualified due to exceeded holding times for the volatile organic fraction. It should be recognized when assessing these samples, however, that they are of a solid matrix in which the holding times are not as critical as in a liquid matrix. Fluid samples allow for greater volatilization of contaminants during handling than do solids such as soils and sediments. Due to the nature of these matrices, holding times are not critical. Resampling was performed on all other matrices due to exceeded holding times.

Issue: In future years, how will the origin of detected off-site contamination be distinguished between FLR and the Burlington County Solid Waste Management Facilities Complex (BCSWMFC)?

Answer: The long-term monitoring program will continue for at least a 30-year period. This, in conjunction with the supplemental sampling program, will: (1) further investigate potential residual contamination; and (2) establish a strong data base prior to the installation of the BCSWMFC.

Issue: A figure of \$300 million was presented in the FS as the cost for excavation and removal of the landfill. What is the origin of this figure?

Answer: The number of facilities nationwide which are currently permitted to accept hazardous waste is very limited. These facilities were contacted for representative prices and trucking costs were evaluated based upon transportation to the closest licensed facility (CECOS Landfill in Niagara Falls, NY). Movement of the 30 acre landfill could

take up to five years with no assurance during the process that CECOS will remain a permitted facility.

Issue: Containment is not permanent. Only two alternatives, containment and no action, have been evaluated; other technologies should be evaluated.

Answer: Other technologies were evaluated (refer to Chapter 3 of the FS - Vol. 3) but were determined inappropriate for this site. Complete encapsulation with a full slurry wall and clay/synthetic cap is a state-of-the-art remediation technology for a landfill of FLR's size. At the June 12, 1986 public meeting, NJDEP made it clear that during the comment period, the public may submit additional alternatives that may not have been considered. None were received.

Issue: No coordination with the emergency departments occurred during this project.

Answer: In June 1985, NJDEP met with representatives of the police, fire and ambulance squads of Florence, Mansfield and Springfield Townships. In addition, representatives of local hospitals were present. Topics of discussion at this meeting included the sampling program for the RT, equipment which was to be utilized and possible emergencies which could arise (their origin, who would respond, etc).

Issue: There are numerous families now using bottled water and bagged ice. My family has suffered from repeated medical problems as well as unexplained illnesses. This imparts not only financial stresses, but emotional strain as well. More work needs to be done to establish the true significance of the contamination there. Containment must be combined with an alternate water supply.

Answer: All sampling, to date, has indicated that there does not exist any potable wells which have contaminants which exceed relevant drinking water criteria. Traces of contamination which have been found cannot be definitively linked to the FLR landfill. By law, there exists no justification to implement public water lines in the area. The supplemental sampling program will be implemented in the Design phase to further address area water quality.

Issue: Were the selection of alternatives influenced by the County and the facility they are building?

Answer: No. Both on-site and off-site facilities were evaluated for leachate and gas treatment. Any reference to a Publicly Owned Treatment Works (POTW) in the FS could mean the use of the BCSWMFC as an option. The BCSWMFC was evaluated as a technically sound alternative for leachate disposal and by law must be addressed. No contracts have been developed for its use.

Issue: What carries more weight in evaluating the alternatives, governmental concerns or local concerns?

Answer: Neither governmental nor local concerns carry more weight over the other during the alternatives evaluation process. Section 300.68 (3)(1) (1-4) of the National Contingency Plan states that:

(1) Selection of Remedy (1) The appropriate extent of remedy shall be determined by the lead agency's selection of a cost-effective remedial alternative that effectively mitigates and minimizes threats to and provides adequate protection of public health and welfare and the environment. This will require selection of a remedy that attains or exceeds applicable or relevant and appropriate Federal public health and environmental requirements that have been identified for the specific site. (2) In selecting the appropriate extent of remedy from among the alternatives that will achieve adequate protection of public health and welfare and the environment in accordance with 300.68 (1) (1), the lead agency will consider cost, technology, reliability, administrative and other concerns, and their relevant effects on public health and welfare and the environment. (3) If there are no applicable or relevant and appropriate Federal public health or environmental requirements, the lead agency will select that cost-effective alternative which effectively mitigates and minimizes threats to and provides adequate protection of public health and welfare and the environment considering cost, technology, and the reliability of the remedy. (4) Pertinent other Federal criteria, advisories, and guidance and State standards will be considered and may be used in developing alternatives, with adjustments for site-specific circumstances.

In Section 300.38(3)(1)(2) "other concerns" includes any state or local concerns. USEPA mandates that the lead agency (in this case NJDEP) conduct a Community Relations Program which addresses local government and citizen concerns. This Responsiveness Summary is a summary of community input.

Issue: We are concerned over the contaminants which do not have standards and which could have potential long term effects on health. The standards for contaminants should be zero parts per billion.

- Answer:** This year, NJDEP expects to complement USEPA's drinking water criteria by setting 16 additional state drinking water standards. The laws under which NJDEP and USEPA function allow for action only in the event that contaminant levels present exceed applicable and relevant standards, criteria or guidelines. All qualifications or descriptions of water quality and all remediation decisions must be made in reference to these standards. All relevant standards will apply to present and future sampling.
- Issue:** Removing the entire wastefill will not remove all of the contamination. Contaminants are already present in the Merchantville Clay. What would be done about the contamination in the clay if the site were to be excavated?
- Answer:** That portion of the affected clay would have to be removed.
- Issue:** Was the Roebling Steel Facility ever evaluated as impacting the upgradient ground water quality of FLR?
- Answer:** No. There has not been any evidence of a connection between the two sites. Roebling Steel is several miles from FLR and is presently being investigated by USEPA under a separate RI/FS.
- Issue:** The FS does not evaluate the off-site risk due to on-site emergencies. We are concerned about the health and safety of local residents during the construction phase.
- Answer:** During the Design phase of this project, a contingency plan to address such emergencies will be developed. This plan will be available for public review upon request. A Health and Safety Plan will be developed for the future construction activities. The plan will be developed in coordination with local input.
- Issue:** When will work be initiated at FLR?
- Answer:** The Design phase, which averages 12 to 15 months in duration, is scheduled to begin in early 1987. The Construction phase is currently projected to begin in 1988, following the completion of the Design. Initiation of further work may be dependent upon Superfund reauthorization.
- Issue:** Who will perform the Operation and Maintenance (O&M) at the site?
- Answer:** O&M is the responsibility of the NJDEP and will be accomplished under contract with a private firm.
- Issue:** What is NJDEP's responsibility in keeping the local communities notified of activities and providing monitoring reports?
- Answer:** Agreements will be made with local officials regarding the circulation of the data results. Other than public meetings and/or briefings at pre-set points in the remediation process (or when major events occur) the community has the responsibility of contacting NJDEP for information.

Written Comments

- Issue:** The general summary of the report (Volume 2, page 1) states that "no significant adverse impacts on the environment or public health have been posed by the FLR Landfill." By the very definition of a "Superfund" site, this is a contradiction.
- Answer:** The statement made in the RI (Vol 2, pg. 1) which states, "the investigations conducted at the FLR Landfill site indicate that no significant adverse impact on the environmental surroundings or public health have been imposed by the facility to date" is accurate with respect to the RI performed by Black and Veatch and does not contradict its status as a "Superfund" site. The National Priorities List (the national ranking of sites eligible for Superfund monies) is comprised of sites with known hazardous wastes that are either presently jeopardizing, or have the potential to jeopardize, public health and the environment. The RI performed at FLR clearly identified hazardous wastes within the landfill. Although no migration has been evidenced off-site to date, there exists a potential for a release, leading NJDEP and USEPA to elect to encapsulate the source.
- Issue:** Twelve volatile organics, three acid compounds and several heavy metals were detected in the B&V monitoring wells, which translates into a variety of environmental threats and health hazards. These contaminants will be a threat to anyone using water from the Raritan-Magothy.
- Answer:** Regarding the variety of contaminants (including volatile organics, heavy metals and acid compounds) which were detected at elevated levels, please be aware that none of these parameters exceeded drinking water standards. The recommended alternative is designed to remove contaminants from the landfill and will alleviate the hydraulic head on the Merchantville Clay formation. It is these hydraulic pressures which serve as the driving force of water through the Merchantville into the Raritan-Magothy.
- Issue:** It is not hydrologically astute of the report to say that "the effects of the contaminant migration from the landfill are limited due to the dilution of the contaminants in the surface waters of the Assiscunk Creek." Because the water dilutes the contaminants, doesn't mean that there are less contaminants, but that they are more widely spread.
- Answer:** The intent of B&V's statement was not to say that the dilution in the Assiscunk Creek was an acceptable method of treatment, but rather a present condition at the site which minimizes off-site impact. As a result of this and other phenomena, an encapsulation alternative has been chosen. In addition, sampling will be implemented to address any potential residual contamination.
- Issue:** There is a contradiction in the two statements that "the investigations conducted at the FLR Landfill site indicated that no significant adverse impact on the environmental surroundings or public health have been imposed by the facility to date" (Vol 2, pg. 1) and "it is the opinion of Black and Veatch that off-site contamination may be

contributed both by unidentified errant sources other than FLR and limited contribution by the FLR Landfill at this time."

Answer: There is no contradiction in terms with respect to claiming that FLR is not imposing a significant adverse impact on the environment and that it could also be a contributing source of erratic contamination found off site. Contaminants found off site were infrequent, with no distinguishable pattern, and were well below known drinking water standards. Therefore, it is NJDEP's and USEPA's judgement that there is no significant off-site impact from FLR and traces of contamination which were found may or may not be associated with the site.

Issue: The ground water is contaminated with arsenic, chromium, zinc, iron, and total organic compounds and we suspect that this is the cause of the high rate of mysterious illnesses and cancer cases in close proximity to the FLR site. In an unscientific survey, we found a cancer rate three times higher than the rate for the State of New Jersey. We petitioned USEPA to do a health survey. The NJDEP spoke with me about a health survey, but nothing was ever done. We have contacted a university to conduct a survey.

Answer: Contaminants found offsite were infrequent, with no pattern and well below any standards. There is no significant impact by FLR and contamination which was found may or may not be associated with it. Therefore, the cause of any illnesses cannot be attributed to FLR at this time. The New Jersey Department of Health is currently conducting a Cancer Cluster Investigation in the area. This is a preliminary step which may lead to a more in-depth survey.

Issue: The residents of the Township of Springfield petition for "total cleanup and removal of all hazardous compounds" from the landfill.

Answer: The estimated cost of this remedial action alternative is \$300 million. Although total removal may seem to be the ideal remedial action alternative, the Superfund budget simply precludes this choice. This figure represents a substantial portion of the total proposed Superfund budget over the next several years and this is only one of 888 sites nationwide:

Furthermore, there are other disadvantages which must be taken into account when considering this alternative. For example:

- Increases in area traffic over a period of years from thousands of heavy-duty trucks which would be needed to remove the waste;
- Increases in the risk of off-site contamination posed by potential accidents involving hazardous waste transportation;
- Lack of licensed disposal facilities available to dispose of such a large volume of waste material (which would probably have to be placed in another landfill).

Issue: We petitioned NJDEP to work closely with us during the course of the RI/FS, but were told that NJDEP was unable to meet with us. We feel we

could have made suggestions concerning the locations of domestic wells that could have influenced the selection of wells tested.

Answer: Requests for additional meetings to discuss sampling data were denied because data had not yet passed Quality Assurance/Quality Control review. The data was not available until two days prior to the public release of the RI/FS. Up until that time, all other information had been forwarded as it was available. The field sampling plan (the scope of work for the investigation and probably the most important document for public input prior to the final report) was forwarded to both Mr. William Wilkens, Attorney for Florence Township, as well as to Mr. Dan Raviv, Mansfield Township's hydrogeologist. Written comments were not received from either party although Mr. Raviv did telephone the NJDEP site manager after his review. His only contention with the potable sampling program was that well-screen depths be determined prior to sampling. In addition, the proposed potable sampling program was modified in response to conversations between USEPA/NJDEP and Mrs. Dorothy Wirth of the Mansfield Township Environmental Commission.

Issue: This land was clean in 1973. None of the seven alternatives presented will restore the land to that condition. There are only two alternatives presented: no action and containment. Containment will not work. The contamination will eventually migrate. Innovative technologies have been identified and should be explored.

Answer: In most cases, it is not possible to return contaminated land to its former pristine condition. Containment with leachate treatment is the best alternative identified for preventing further environmental impacts via contaminant migration. In Chapter 3 of the Feasibility Study, Black and Veatch evaluated the known technologies to date. The implementation of a slurry wall was the only applicable state-of-the-art technology for a thirty-acre landfill. The development of further alternatives was requested from the communities during the public meeting for NJDEP/USEPA review. None were received.

Issue: The threats posed by FLR are minimal and are representative of those of a sanitary landfill. Nothing in the B&V RI/FS demonstrates any justification for the site's inclusion on the National Priorities List. The lavishly expensive remediation alternatives presented in the FS are wholly unwarranted and represent overly complex methods of closure that exceed NJDEP's normal requirements for landfill closure.

Answer: Although the RI/FS states that the landfill is representative of a typical municipal sanitary landfill, the data collected during the field investigation determined the presence of elevated levels of hazardous substances in the ground water and soils in the FLR Landfill. Substances found in the ground water in the landfill include 351 ppb 1,1 dichloroethane, 148 ppb ethylbenzene, 787 ppb toluene and 1600 ppb arsenic. The landfill soils contain 79,609 ppb toluene, 298 ppb pentachlorophenol, 30,100 ppb bis(2-ethylhexyl) phthalate and 2030 ppb tetrachloroethylene. Section 104(a) of CERCLA states that "Wherever any hazardous substance is released or there is a substantial threat of such a release into the environment...the President is authorized to act, consistent with the National Contingency Plan (NCP) to provide for

remedial action relating to such hazardous substances..." The hazardous substances found in the FLR Landfill pose a threat of release into the environment and therefore the USEPA and NJDEP are acting to remediate the site consistent with the NCP. The alternative selected in the R.O.D. is designed to prevent the release of the hazardous substances from the landfill into the environment.

Issue: Hazardous compounds found in the leachate were at lower concentrations than that found two years ago, which indicates a dilution of contaminants in the wastefill. The impacts on ground and surface water quality downgradient of the site are minimal.

Answer: Dilution of contaminants does not mean that they disappear, rather that are spread over a larger area. In the case of FLR, ground water in the landfill containing hazardous substances is migrating from the landfill into the adjacent Pleistocene Aquifer. This release or even the potential release of hazardous substances provides authorization to remediate the site consistent with the NCP under Section 104(a) of CERCLA.

Issue: No elevated levels of volatile organic compounds were detected in the air at the site.

Answer: Page ii of the RI report states that "the presence of elevated levels of volatile organic compounds was not detected (in the air emissions from FLR)." This statement refers to the fact that no specific volatile organic compound was identified at elevated levels. The air data on Tables 8.2, 8.3, and 8.4 do in fact show levels of volatile organics onsite as high as 180 parts per million. Regardless of the results of the air investigations, a remedy involving capping of the landfill necessitates gas collection and treatment to alleviate the build up of gases within the landfill or gas migration through the ground.

Issue: This site was improperly placed on the National Priorities List and should be delisted now. The RI shows that closure under CERCLA is unnecessary. No significant adverse impact on the environment or public health have been posed by the facility to date.

Answer: Although B&V stated that "no significant adverse impact on the environmental surroundings or public health have been imposed by the facility to date", the potential for adverse impacts exists and is the justification for remediating this site consistent with the NCP. In its present state, the FLR landfill site does not meet the criteria for deletion from the National Priorities List. This site will be eligible for deletion after the necessary remedial actions are taken and it is proven, via monitoring, that a potential public health or environmental threat no longer exists.

The NJDEP and USEPA believe that there is evidence of some migration from the FLR landfill into the environment. Downgradient well BV-5S in the Pleistocene Aquifer, contained 231.61 ppb of total organic compounds. The Assiacunk Creek contained 9.42 ppb of pentachlorophenol and 16.5 ppb of phenol. The RI/FS estimated that contaminants from the

landfill would migrate through the Merchantville Clay to the Raritan-Magothy Aquifer in 24 years if the landfill remained in its present state.

Issue: This site will soon be surrounded by the proposed BCSWMFC. Any chance of lateral migration of leachate from FLR will be foreclosed by the containment barriers which must be constructed for the solid waste facility.

Answer: The containment system for the solid waste facility is not being designed to "foreclose" leachate from FLR and cannot be relied on to do so. They are independent facilities whose retention mechanisms will not interact with one another.

Issue: Governmental, public and judicial knowledge can certainly be taken with regard to the serious domestic water supply contamination problem in private potable water supplies located in proximity to the FLR Landfill. Vinyl chloride, methylene chloride, chloroethane, 1-2-dichlorobenzene, bis (2-ethyl hexyl) phthalate, arsenic and numerous other carcinogens have been found in significant concentrations in domestic water supplies in both the shallow Pleistocene Aquifer and the deep Raritan-Magothy Aquifer.

Some of the concentrations of these contaminants are in excess of five times the concentrations found in field blanks and therefore merit further intense investigation. This data has been compiled over the last several years as a result of tests performed by NJDEP, USEPA, Burlington County, Mansfield Township and private water well investigations by concerned residents.

Mansfield Township has, in fact, expended a great deal of time and money with regard to its efforts in having its ground water hydrologist, Dan Raviv Associates, perform water tests throughout the township in an effort to analyze contaminant data and contaminant sources.

The alarmingly high cancer occurrences and cancer related deaths experienced by residents living in close proximity to the contaminated wastefill area has been repeatedly communicated to various USEPA and NJDEP officials over the last several years. Cancer occurrences in the area of the township where the FLR landfill is located exceed the New Jersey average by approximately three hundred (300) percent.

At a conference in Washington, D.C., prior to the award of the RI/FS contract to B&V, William N. Hedeman, Jr., then Director of the Office of Emergency and Remedial Response in the Federal Superfund Program, indicated that the domestic water supply contamination problem would be investigated in conjunction with and as a part of the RI/FS for FLR and that remediation of FLR would be coordinated with the location and construction of the BCSWMFC proposed by the Burlington County Board of Chosen Freeholders on the parcel of land adjacent to the FLR Landfill site.

Township representatives have repeatedly expressed their concerns over deferring commencement of waste filling operations in the new County landfill next to the FLR Superfund site until remediation has been completed and domestic water supplies are free from contamination. The Township has also expressed an additional concern pertaining to the location of a 1,200-unit adult community, which is now being completed, which is supplied by water with two on-site wells. This development is located approximately one mile from the FLR Wastefill area. Mansfield and Florence Townships were, therefore, under the opinion and belief, based upon representations from NJDEP and EPA, that the scoping of the project included an expansive investigation, dealing with both source and off-site contamination and environmental concerns, and that the factors set forth in 40 CFR Section 300.68(e) would be incorporated into the RI/FS analysis. Pursuant to subsection (e) (1) (3i) of 40 CFR Section 300.68 (e), the expanded analysis would necessarily include an analysis of "contaminated drinking water at the tap" and remediation measures responding thereto, including provision for water supplies.

All of these concerns were again expressed at the first public meeting arranged by your office which was held on May 2, 1985. Both Townships and their residents were led to believe that such an expanded analysis was part of the study, especially in light of the following statements contained in Section 2.4, entitled Potable Water Supply Well Inventory, on Page A-14 of B&V's Project Specific Proposal for FLR:

"as part of the field operations, a survey of domestic and any public, water supplies within a one-mile radius of the site will be conducted. The purpose of this survey will be to identify domestic water supply wells that may have been impacted by contaminant migration from the site and to further define the geologic and hydrologic conditions in the area."

Needless to say, the Townships were dismayed to find, upon receipt and review of B&V's RI/FS Report two weeks ago, that B&V did not investigate domestic water supplies within one mile of the contaminated waste fill area as represented, but, instead, simply tested twenty domestic wells located in close proximity to the waste fill area. The Township officials and the residents and professional consultants were equally dismayed that B&V did not expand their investigation and study upon finding contaminants in those wells sampled. B&V simply indicated that further tests should be conducted in the future with respect to these issues and, as will be discussed in subsequent comments, indicated that the contaminant source might not be the landfill inasmuch as the same or similar contaminants were found in both upgradient and downgradient wells.

Based upon the limited scope of the investigation, B&V concluded in its RI that the contamination was "source contained". The remediation alternatives suggested in the FS were predicated upon and presuppose the accuracy of this conclusion in the RI. The Townships feel that the remedial alternatives may not accurately or fully address the nature, scope and breath of appropriate remedial measures if the supposition in the RI pertaining to "source contamination" is incorrect, unsubstantiated and/or inconclusive.

Answer: It is the opinion of NJDEP and USEPA that the potable sampling program performed by B&V was in accordance with Mr. Hedeman's assurances to the Townships, the CFR and the project-specific proposal submitted by B&V. As per Mr. Hedeman and the CFR, a domestic water supply investigation was performed to assess the potential impact of FLR on area potable wells. The traces of contaminants found in potable wells did not exceed current drinking water standards and could not be directly associated with FLR. Regarding the "one-mile survey" listed in the proposal, a survey does not include every home within a one-mile radius, rather a representative sample of a potentially affected Community. B&V, in their response to Dan Raviv's comment letter, did in fact, map out the 20 samples taken and found that a one-mile radius had been addressed (see attached).

Issue: The Townships were advised by USEPA and NJDEP that an enforcement action would be brought by the government(s) under CERCLA to recoup its costs incurred resulting from investigation and remediation. However, Page 5-58 of the FS (Volume 3) indicates as follows:

"An endangerment assessment is often prepared as part of the public health assessment for enforcement-related remediations. Since the remediation to be performed at the FLR Landfill is not currently defined as an "enforcement action" under CERCLA, a separate endangerment assessment has not been performed."

NJDEP's enforcement attorney was present at the June 12, 1986 public meeting and representations were made at the premeeting conference with the Municipal officials that an enforcement action would be brought by the government. The Townships request written confirmation that an "enforcement action" under CERCLA will be instituted by the government and that a separate endangerment assessment will be performed and made available to the Townships within the next several weeks. The Townships have incurred substantial investigatory and remediation costs on their own and may wish to commence litigation to recoup their costs. I am advised that Florence Township has already filed a "Notice of Claim" under CERCLA.

Answer: An exposure assessment was completed (RI/FS, Volume 7, Appendix Q) which identified the exposure pathways at the site, and as a result the recommended alternative was designed to eliminate these pathways. The supplemental sampling program will address both ground water and surface water quality. In the event that contamination is detected in potable wells at levels which exceed present drinking water criteria and which can be linked to FLR, a risk assessment will be performed at that time. With regards to the aforementioned enforcement action, an investigation to identify potentially responsible parties (PRPs) is in progress for the purposes of potential cost recovery and enforcement actions in regard to future costs of remedial activities. Parties identified as PRPs will be sent notice letters offering them the opportunity to perform the Design and/or Construction activities recommended in the Record of Decision before USEPA and NJDEP make a decision to fund any future work. Should they decline, they are potentially liable for treble damages.

Issue: Both the RI and FS devote substantial verbiage to an explanation of groundwater flows in both the shallow aquifers in the Pleistocene deposits and the deep Raritan-Magothy Aquifer. Reference is made to prior studies and reports focusing on the geologic and hydrologic analysis of the site by Geraghty and Miller, Inc. (G&M), Woodward-Clyde, Richard A. Alaimo Associates, Princeton Aqua Sciences, Inc. and Roy F. Weston. Page 5-30 of the RI (Volume 2) indicates that "The configuration of the potentiometric surface contour lines (See Figure 5.7) indicates a general ground-water flow direction from the northwest to the southeast and south, toward Assiscunk Creek." Several sections in both the RI and FS indicate that this "flow description" applies to both the shallow aquifers and the Raritan-Magothy Aquifer. Other sections in the reports indicate that this "flow description" applies to both the shallow aquifers in the Pleistocene deposits. The Townships request written clarification from B&V as to whether this "flow description" is limited to an analysis of the shallow aquifer flows and/or whether the "flow description" is also applicable to flows in the Raritan-Magothy Aquifer. At the June 12, 1986 public meeting, Lawrence J. Hosmer of B&V presented a slide which was shown to the public which appeared to indicate that the flow description applies only to the shallow aquifers in the pleistocene deposits.

Answer: Please refer to the attached B&V letter.

Issue: As indicated previously, B&V has offered an opinion that the groundwater flow is from the northwest to the southeast to the south towards the Assiscunk Creek. B&V has concluded that the contamination found in "upgradient" wells cannot be caused by the landfill inasmuch as the landfill is hydrologically "downgradient". B&V has also indicated that groundwater flows can be changed by heavy water utilization and pumping in the area. The Townships feel that an explanation is in order from B&V to reconcile these two statements and opinions. The Townships request written confirmation from B&V that the contamination found in the supposedly "upgradient" wells cannot possibly be coming from the FLR waste fill area.

Answer: Please refer to the attached B&V letter.

Issue: B&V indicates that the waste fill area is located in close proximity to the Raritan-Magothy recharge area and that this aquifer is recharged by the Delaware River and through vertical downward infiltration from overlying water sources. B&V has also indicated that the Merchantville Clay Formation, which overlies the Raritan-Magothy Aquifer, "...is fairly irregular and suggests the presence of remnant fluvial-induced, erosional features." Notwithstanding the foregoing comments, B&V has determined that the existence of the Merchantville Clay Formation can be expected to protect the Raritan-Magothy Aquifer from leachate contamination. These statements and this analysis appears to conflict. If the Raritan-Magothy is "impermeable", the Raritan-Magothy Aquifer would not be able to be recharged by vertical seepage from shallow aquifers. The Townships request a written explanation from B&V further expanding upon the "permeability factors" of the Merchantville Clay Formation. It is also to be noted, as I advised at the June 12 public meeting, that Beatrice Tylutki testified

in court proceedings in the late 1970's that the Merchantville Clay Formation had been pierced under the waste fill area and that the waste fill leachate was then contaminating the Raritan-Magothy Aquifer. An explanation is in order as to why DEP and B&V's current position appears to be that the Merchantville Clay Formation has not been pierced and that there is no contamination seeping into the Raritan-Magothy Aquifer.

Answer: The RI/FS report did not state that the Merchantville Clay Formation was "impermeable" but rather was characterized by low permeability. In fact, B&V has acknowledged that, given present conditions, break through of the clay would occur in 24 years. As a result, the recommended alternative seeks to mitigate the driving hydraulic force which "pushes" the contaminants through the clay. This will be achieved by encapsulating at the landfill with state-of-the-art technologies, and by extraction of the remaining liquids within the fill material. In response to the inquiry as to the testimony of Beatrice Tylutki, the site manager, Beth Muhler, has contacted Mayor Sharon Worrell of Florence Township to obtain the court proceedings. However, their existence does not alter the fact that neither the pump tests nor the samples taken during the RI/FS indicated a direct hydraulic interconnection between the upper and lower aquifers. In the event that the court proceedings do indicate a "pit" of some sort, this information will be considered during the Design phase.

Issue: SURFACE WATER IMPACTS AND SOIL SAMPLINGS. Methylene chloride was found in both the surface water and soil samples that were taken. B&V concludes that water quality in the Assiscunk Creek has "changed slightly in the last three years" and that several constituents exceed the state's water quality standards. A review of Table 6.1, which compares upstream and downstream stations, reveals that fecal chloroform, fecal strep and phosphate levels are all in violation of the State standards. A series of other chemicals, including phenol, were present in both the Assiscunk Creek and the drainage channel located adjacent to Cedar Lane extension. B&V indicates that "it is also theoretically possible that these constituents are emanating from the waste fill since phenol was present in the water in BV-2S and pentachlorophenol was present in the soil in B-03." B&V also found that phthalate contamination actually increased in concentration approximately 54 feet into the Merchantville Formation. The existence of the methylene chloride contamination along with the other contaminants that were found at the levels that they were found in the soils and in the Assiscunk Creek should have spurred additional investigation by B&V. However, B&V simply reported the existence of the contaminants and stopped its investigation after rendering an opinion that the contamination could not be caused from the waste fill area. It is obvious to anyone investigating the FLR Landfill that it is the only source of contamination in those portions of Florence and Mansfield Townships. B&V should have expanded its investigation as opposed to stopping its investigation when these contaminants, at the levels found, were detected.

Answer: The RI/FS found that the trace levels of contaminants detected in the surface water and soils could not be directly linked to FLR in the form

of a ground water plume, but acknowledged FLR to be a potential source. It is the acknowledgement that has prompted both the USEPA and the NJDEP to endorse the complete containment of the landfill. In addition, to address potential residual contamination, a sampling program will be initiated in the Design phase and has been incorporated as part of the selected remedy.

There has been misinterpretation with respect to B&V's statement regarding the concentrations of contaminants increasing at 50-60 feet in the Merchantville Clay. This depth reference was relative to the top of the wastefill and represents the junction of the clay and the wastefill. For further clarification, refer to Volume 2, table 7.3, "Wastefill" heading, B02-02 and Volume 2, Figures 4.5-4.8.

Issue: REMEDIAL ALTERNATIVES. At the June 12, 1986 public meeting, DEP and B&V indicated that Alternative 3, with modifications thereto, would be the selected remediation procedure. The Townships feel that additional off-site monitoring wells should be included in the remediation process to further investigate contaminant levels. Additionally, provisions for potable water supply for the residents in the area should be included in the remediation alternative. Many of the residents living in close proximity to the landfill have been drinking bottled water since the late 1970's. Installation of a water line connected to the Burlington Township public water supply is in order for the protection of these individuals.

Answer: An additional sampling program has been included in the selected remedial alternative. This program will include the implementation of additional upgradient and downgradient monitoring wells and the respective sampling of these wells, pre-existing wells, select potable wells, surface water and sediment matrices.

Consistent with the explanation provided in the June 12, 1986 public meeting, the provision for a public water supply cannot be performed via the FLR Superfund Project. All data, to date, has not indicated an impact from the landfill on local potable supply wells. Methylene chloride, the reoccurring contaminant found in the potable wells, was found both upgradient and downgradient of the landfill and was well below drinking water standards. In the event that future sampling demonstrates a potential public health problem associated with the drinking water supplies, appropriate remedial action will be considered.

Issue: It is my understanding that 2-ethyl hexyl phthalate concentrations were found in wells that have been installed by Burlington County on the tract of land adjacent to the FLR Landfill where the new County Landfill is to be located. Based upon the B&V reports, this area is supposed to be "upgradient". An explanation is requested from B&V as to how this situation could occur. As referred to earlier in this letter, B&V has neglected to investigate the sources of the contaminants found in the supposedly "upgradient" wells. A more intense and detailed investigation and analysis of this issue must be conducted.

Answer: Levels of bis-2-ethyl-hexyl phthalate, well below current drinking water standards, were found both by Burlington County during their field investigations and by USEPA in their August 1985 investigation of the water problems being experienced by the people of Columbus. This is a recurring regional problem that Mansfield Township's own hydrologist, Dan Raviv Associates, has not been able to pinpoint a source for. Its occurrence has been so varied and irregular that no direct link has been established to FLR or any other source. NJDEP has begun to investigate potential sources, other than FLR, that might be the cause of the phenomenon.

B&V was contracted through federal funding to address the FLR landfill and its subsequent impact on the environment and public health of the surrounding community. Ground water flows were established in agreement with the NJDEP's Division of Water Resources, and upgradient and downgradient flow conditions clearly defined. You are referred to the attached B&V letter for a further discussion of this issue.

Issue: The accuracy of the lab tests and data that was compiled is questionable in light of all of the Quality Assurance problems and improper testing procedures utilized. The conclusions drawn by B&V are based upon the inaccurate and incorrect data. It is suggested that retesting and reanalysis is in order to assure the quality of the lab results and data on hand.

Answer: Attached, please find an intra-Departmental memorandum which summarizes the qualifications on the laboratory data. This should replace Appendix G of the RI/FS which was an incomplete draft of this attachment. In addition, the "QD" denotation on the six potable samples is incorrect. It referred to the qualifications on the first round of sampling. The numbers presented represent the resampling performed for the volatile organic fraction which had originally exceeded holding times. In light of this information, the quality assurance problems, after resampling, were minimal.

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June 27, 1986

Ms. Beth I. Muhler, Site Manager
New Jersey Department of Environmental
Protection
Hazardous Site Mitigation Administration
428 East State Street, Second Floor
Trenton, New Jersey 08625

Dear Ms. Muhler:

Re: Response to Public Comment -
Florence Land Recontouring (FLR)
Landfill RI/FS

In accordance with your request, we have reviewed the comments received by the New Jersey Department of Environmental Protection (NJDEP) from the firms of Parker, McCay & Criscuolo, P.C. and Dan Raviv Associates, Inc. (DRAI) during the public comment period relative to the remedial investigation/ feasibility study conducted at the FLR Landfill in Burlington County, New Jersey. The comments offered by DRAI are specifically addressed in this response. General information is also provided to assist the NJDEP in responding to Parker, McCay & Criscuolo, and as a result of a Black & Veatch review of the "Preliminary Interpretation of the Regional Hydrogeology in the Vicinity of the FLR Landfill", prepared by DRAI. This response is organized so as to directly correlate with the points addressed by DRAI.

1. Merchantville Formation Characterization

Comment:

"Black & Veatch indicate that the Merchantville occurring in the study area consists of strata of clay, silt, and sand which are vertically and laterally discontinuous. The report is deficient in describing the occurrence and lateral movement of ground water in the Merchantville, which would impact potential contaminant movement from wastes in the overlying FLR landfill. A quantitative analysis of the rate of downward infiltration, based on differences in ground water levels between all three units, is also lacking in the Black & Veatch study."

Response:

Discussion presented in the RI report with respect to the potential for the vertical and lateral migration of contaminants through the Merchantville Formation is necessarily limited to the extent of data available. A quantita-

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tive assessment of vertical and lateral flow through the Merchantville Formation, and an assessment of the potential for contamination of the Raritan-Magothy Formation by the landfill, were not performed during the RI/FS because the existing database was not sufficient considering the heterogeneous character of the formation. The hydraulic conductivity of each of the 3 geologic units is indeed integral to determining cross contamination potential; however, the level of detail appropriate to the overall scope of the study was applied in order to determine the physical properties of each unit. Additional data on the head and the vertical/horizontal permeability distributions across the Merchantville Formation would be required to prepare a reasonably precise, quantitative assessment. This level of data is being gathered by Woodward-Clyde Consultants for the confining unit underlying the proposed Burlington County SWMFC. By analogy, justified by the proximity of the facility to the FLR Landfill site and similar depositional and physical properties of the Merchantville and Woodbury clays, the Woodward-Clyde data and assessment would most probably be reasonably applicable, and therefore could be employed at the FLR Landfill site, once complete. It is anticipated that this information, based upon preliminary discussions with Woodward-Clyde, would correlate favorably with the parameters utilized for the Merchantville clay at the FLR Landfill.

The ability of the middle stratum, the Merchantville Formation clay, to maintain the 2 overlying/underlying aquifers as separate units was measured during this study in terms of a vertical permeability (k_v). As discussed in Section 5.1.2, page 5-3 of the RI report, the k_v value of the Merchantville clay underlying the site averages 1.2×10^{-6} centimeters per second (cm/sec). Laboratory analysis of the coefficient of permeability north of the FLR Landfill site was 10×10^{-7} cm/sec. These data are limited to vertical permeability; the relationship of the horizontal permeability to the vertical permeability can vary throughout a stratum, but may generally be represented by a translational factor.

For a homogeneous, isotropic material, k_h and k_v would be the same, or $k_h/k_v \approx 1.0$ would be appropriate; however, most formations have a characteristically greater component of permeability in the horizontal direction as a result of depositional patterns which subsequently control lateral migration. Literature and experience with the Merchantville Formation clay indicates an approximate horizontal permeability on the order of 5 times the vertical permeability. Lateral movement of ground water in the formation is, however, limited by both the soil and depositional characteristics within the unit. As described in Section 7.1.1.2 of the RI report,

"...the Merchantville Formation materials consisted primarily of a greenish-gray to olive-black, glauconitic silty, clayey sand, with occasional thin lenses of sand."

Relatively impervious pockets and thin lenses within the Merchantville Formation could theoretically transmit water if an outlet were available; however, ground-water flow cannot, in general, be transmitted through the lenses due to the discontinuity of the Merchantville matrix.

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The presence of ground water within the Merchantville Formation was determined by a review of the physical parameters of the soil. Samples of the Merchantville clay were obtained and subjected to physical testing to determine density, moisture content, particle-size and hydraulic conductivity; in addition, calculations were performed utilizing recorded water levels to determine permeability and hydraulic gradients. The Merchantville Formation discussion did not elaborate upon ground-water flow or occurrence due to the lack of ground water detected within the matrix.

2. Ground-Water Flow

Comment:

"Ground water in the Pleistocene aquifer and Raritan-Magothy aquifer is described as moving in a southeast direction. These flow directions are based on water level measurements taken at the FLR site only. The Black & Veatch study is deficient in information concerning the relationship between ground water flow directions at the site and the surrounding area. Consequently, evaluations concerning the impact of the FLR and proposed BCSWMFC on area ground water flow directions and potential contaminant migration routes cannot be made."

Response:

At the FLR Landfill site, several factors influence the ground-water flow pattern, such as the proximity of Assiscunk Creek, on-site leachate pumping, and the hydraulic head on each geologic unit. These factors in addition to water level measurements observed in each well were considered when determining ground-water flow. Off-site influences such as major well fields and the BCSWMFC may additionally have an affect on the local hydrologic regime. The RI report is intended to discuss the near-local pattern of ground-water flow; a complete regional hydrologic assessment of the ground water was not performed since the CERCLA program confines the study area to the site and immediate influences.

The regional flow direction toward the southeast in the Raritan aquifer beneath the site was determined from potentiometric levels in the monitoring wells. This direction is consistent with previous data developed by Geraghty & Miller, with the Woodward-Clyde data developed for the proposed BCSWMFC, and with the original pre-pumping regional flow pattern in the aquifer. This flow pattern has been observed at and near the site during the several recent investigations (and is supported by the DRAI "Preliminary Investigation"); misinterpretation of this regional flow direction is therefore unlikely.

Near Camden, and at other locations, large pumping troughs have disturbed the original potentiometric surface and the original flow direction in the aquifer. Some small-scale maps depict the trough as extending to the vicinity of the site, but the effects of pumping at more distant centers such as this are not yet apparent at the site. The potential impact of the Burlington County facility on flow in the Raritan-Magothy Formation relates primarily to a reduced aquifer recharge over the facility area. That aspect has been

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analyzed by Woodward-Clyde in their report to Burlington County. If a substantial reduction of the recharge was to occur, a flow component from the FLR Landfill toward the County facility might be expected to originate. However, the Burlington County facility represents a relatively small portion of the total recharge area available to the Raritan aquifer, and therefore the likelihood of a significant depression occurring is remote. The potential for a depression occurring would be further mitigated by the short-term mounding effect which could occur during loading of the soil structure with the BCSWMFC landfill.

3. Location of BV-4D

Comment:

"Sampling of deep well BV-4D which was constructed to monitor upgradient conditions (background) in the deep aquifer indicated the occurrence of contaminated ground water. In our opinion, this well is located too close to the existing lagoons to be qualified as a background well. Mounding effects due to the operation of the lagoons may have caused downward and localized upgradient movement of contaminated ground water recharge."

Response:

The comment poses two questions. If the well reference is incorrectly stated in the comment; i.e., BV-4S is potentially locally downgradient and contaminated by the lagoons rather than BV-4D, the RI report describes Black & Veatch well number BV-4S as regionally upgradient, but locally downgradient of the site. Two portions of Section 5.3.3 of the RI report describe the location of BV-4S as follows:

"A portion of the ground-water flow beneath the wastefill was diverted beneath the western end of the wastefill. This may be due to the removal of overburden material beneath a large portion of the wastefill and replacement with low-permeability waste, thereby creating a barrier to ground-water flow. A shallow surface depression over the area appears to be recharged by ground-water flow resulting from the "damming" effect created by the low-permeability material. It is assumed that this pond receives both surface-water run-off and ground-water inflow. Downgradient, in the southern portion of the higher transmissivity zone, the ground-water flow divides partly toward Assiscunk Creek and the remainder toward Cedar Lane Extension. The low-permeability zone located near GM-39 and GM-48 appears to promote this diversion. Based on this analysis, well BV-4S is considered to be located regionally, hydraulically upgradient of the wastefill, and wells BV-5S and BV-6S are located downgradient of the wastefill."

Ground-water mounding beneath the lagoons in this instance may indeed have an effect on the ability of well BV-4S to serve as an upgradient (background) well. As described in the RI, local discharge from the lagoons could occur through the vadose zone in a radial pattern until intercepted in

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the ground-water regime; a mounding effect could thereby be created which would permit local; i.e., in the vicinity of the lagoons, flow in a northwesterly direction (regionally upgradient). However, upon mixing with the regional ground water, the direction would reverse to characterize the regional flow direction. Monitoring in the "mixing zone" could be indicative of conditions which do not represent regional background. For this reason, additional off-site monitoring wells are proposed for installation during the design of the site remediation, and incorporation into the overall site monitoring system.

The thickness of the Merchantville Formation in the vicinity of wells BV-4S/D was determined to be approximately 68 feet. Mounding of the Raritan aquifer at this location, created by surcharge loading of the surface by the lagoons, is highly remote considering the light applied loads and pressure distribution with depth. Significant recharge of the Raritan aquifer, through the Pleistocene deposits and the Merchantville Formation, by the lagoons is also considered remote since contaminants released by the lagoons would be intercepted, diluted and transported by the shallow aquifer, thereby minimizing the contaminants available for further vertical percolation. The increased hydraulic head applied by the mounding in the shallow aquifer, in an area in which the Pleistocene deposits are thin (on the order of 10 feet in thickness) would be minimal, resulting in a limited vertical migration potential through the Merchantville Formation; this increased head would most probably be offset by the relatively greater thickness of the Merchantville Formation in this area. Contamination noted in the analysis of samples from BV-4D is therefore considered to be generated by off-site, upgradient sources.

Monitoring well BV-4D is considered to represent regional upgradient conditions in the Raritan aquifer, as stated in Section 5.3.3 of the RI report:

"Potentiometric surface maps of the Raritan aquifer were constructed based on water-level measurements. The elevations of the water surface ranged from -3.0 feet Mean Sea level Datum (msl) near the leachate lagoons to -6.0 feet msl. The potentiometric contours consist of nearly straight lines with equal interspacing indicating flow direction toward the southeast. In a regional sense, well BV-4D is therefore located hydraulically upgradient of the wastefill, and well BV-6D is located downgradient."

As stated previously, additional upgradient wells, to be installed during the design phase, will be intended to verify this assertion.

4. Transmissivity of the Merchantville Formation

Comment:

"The evaluations are deficient in data pertaining to water level response in the Merchantville Formation during the tests. This data is necessary for quantification of the amount of ground water and subsequent routes of potential contaminants released to the Raritan-Magothy aquifer under pumping conditions (e.g. from ground water supply wells)."

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Response:

Water level responses were not observed in the Merchantville Formation as the purpose of the pump tests in the deep wells was to ascertain the hydraulic characteristics of the Raritan aquifer at these locations. Other techniques; e.g., literature search values and laboratory testing of relatively undisturbed samples for permeability and particle-size characterization, rather than in-situ, full-scale pump tests were employed to determine the hydraulic characteristics of the Merchantville Formation.

5. Drawdown Effect

Comment:

"Black & Veatch indicate that no effects of pumping in the Raritan-magothy were observed in the shallow aquifer. A positive response would be indicative of the potential for downward ground water movement and subsequent potential contaminant movement. A deficiency in this interpretation is that it is possible that the duration and rate of testing were too low to cause sufficient amounts of ground water movement during the short testing period. Black & Veatch indicate that a "significant recharge effect" was observed during the testing of wells completed in the Raritan-Magothy Formation. This affect may be the result of ground-water being released from the overlying Merchantville Formation which has been characterized by Black & Veatch to be of low permeability and an effective barrier to downward contaminant movement, but also a source of recharge."

Response:

The Raritan aquifer is one of the major potable water resources for the New Jersey coastal plain; many of the domestic and municipal well fields in the area withdraw water from this aquifer. Since the available yield in the Raritan aquifer is significant, the small-scale, limited pump tests conducted during the RI/FS placed a localized, and therefore inconsequential overall demand on the aquifer system. Unless the aquifer was sufficiently stressed so as not to be readily recharged, thereby developing a suction head on the overlying Merchantville Formation, flow through the Merchantville Formation clay would necessarily be driven, and limited by the physical characteristics of the formation such as permeability and the gradients applied by the overlying strata. Since it is not reasonable, in an investigation of this type, to stress an aquifer with such a significant yield as the Raritan, the duration and rate of pumping in these tests should have no impact on the transmission characteristics of the overlying Merchantville Formation.

6. Transmissivity Values

Comment:

"Many of the assumptions inherent in the methods of analysis used to evaluate the aquifer hydraulics testing data are violated due to their application to observations made solely in pumped wells.

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Consequently, the transmissivity values obtained from the evaluations are subject to error. The transmissivity values obtained by Black & Veatch for the Raritan-Magothy formation are consistently lower (greater than an order of magnitude) than those reported by the USGS (Gill and Farlekus, 1976). Using lower transmissivity values might lead to a false sense of safety in determining if a pumping well, which was completed in the Magothy-Raritan aquifer near the site, could be affected by potential contamination."

Response:

Pump test data from the 3 deep wells were interpreted using standard analytical techniques (Theis and Jacob for drawdown and recovery periods). The pump test set-up; i.e., single-well, limited test duration, may be debated as to the level of accuracy produced, but the interpretation represents an appropriate application of the technique within the bounds of the test set-up.

The pump test results indicate that the transmissivity and hydraulic conductivity values varied by over an order of magnitude for the tested sections of the 3 wells. Such variability is consistent with the lithology of the sections. The reported "recharge or discharge" effects apparent for the test curves were logically interpreted as manifestations of the lenticular character of several horizons, an observation also indicated by geologic data. In addition, as only the upper 20 feet of the aquifer section was tested, the values obtained should not be interpreted as representative of the entire aquifer section. Also, any comparison of the site-specific values of the aquifer parameters with the "regional" values can be made only if the aspects of variability and position of the test section are considered.

7. Domestic Well Contaminant Source

Comment:

"The study indicates the occurrence of numerous landfill affiliated contaminants in ground water at the FLR site. The Black & Veatch study initially states that methylene chloride was the only contaminant detected in sampled domestic wells located upgradient and downgradient of the site. The levels detected are reported by Black & Veatch to be significantly less than the suggested USEPA health advisory criteria. Black & Veatch indicates, further on in the study, that other contaminants (Acid Base Neutral Compounds) were found in the majority of the domestic wells sampled. The ground water quality in the area of the site is qualified by Black & Veatch as "good". No definitive statement is made concerning the sources of the detected compounds."

Response:

The concentrations of methylene chloride in domestic well water samples; while significantly lower than health advisory standards, were exhibited in higher levels and detected more frequently than the acid extractable or base/neutral compounds. Due to a lack of existing criteria, standards, or

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advisory levels for the compounds detected which fall within the acid extractable or base/neutral fractions, specific comparisons and statements as to the water quality cannot be made; no definitive statement was therefore offered regarding the potential for health hazard. However, based upon the number, types and levels of contaminants present, and consideration of areal background and anticipated levels, the overall water quality was characterized as good.

In response to the comment that "no definitive statement is made regarding the sources" of these compounds detected, a variety of possible sources could be considered. Several sources potentially contributing to the acid/base/neutral compound levels detected include: other land disposal operations in close proximity (several of which are under investigation by the USEPA/NJDEP at the present time); other commercial/industrial operations; and agricultural sources. In addition, the mere installation of domestic wells has a history of being a primary contributor of phthalate compounds in well water due to the construction components of the wells. Contributions by the above sources are beyond the consideration of the FLR Landfill RI/FS activities, which are intended to identify contaminants in the wastefill and the extent, if any, of their migration, but not the identification of external contaminants and sources.

8. Domestic Well Sampling Protocol

Comment:

"It does not appear that Black & Veatch compiled well logs for the domestic wells which were sampled during this investigation. In addition, the protocols for domestic well sampling are not presented in the RI."

Response:

A search of records maintained by the NJDEP, Division of Water Resources was conducted at the outset of the FLR Landfill RI/FS studies. This search was intended to identify and assimilate data on domestic wells within a 1.0 - mile radius of the site. (A copy of the data obtained for the domestic wells is attached to this letter.) Based upon this data, prior sampling locations and information developed during previous studies, and interviews with residents in the area, the 20 domestic well locations were jointly identified by USEPA/NJDEP and Black & Veatch. These locations were selected as representing a variety of conditions, such as aquifer tapped, location in the aquifer with respect to the FLR Landfill site, availability of sampling points, and sampling history, and were authorized by the appropriate owners.

The sampling of the domestic wells was performed in accordance with both NJDEP and USEPA sampling procedures, as described in the Black & Veatch, Engineers-Architects, Field Sampling Plan for the Florence Land Recontouring Landfill site, dated May 17, 1985. All samples were collected from that point in closest proximity to the well, and most accessible. Strict decontamination, sample packaging and handling, and chain-of-custody protocols were exercised during the execution of this task.

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Prior to sample collection, water was evacuated from the point source for 15 to 30 minutes to flush residual contaminants commonly built-up in domestic plumbing. The location of each point source varied dependent upon domestic well availability. In addition, care was taken to avoid water treatment systems such as softeners so as not to introduce any "new" constituents which could affect the ionic conditions in the water. The specified locations of each point source where a domestic well water sample was obtained is specified in Table 1. The locations of each source point was a factor considered during the evaluation of final analytical data.

9. Data Restrictions

Comment:

"It is strange that Black & Veatch, after their 'extensive' sampling program, devoted one section of the RI (Section 10.0) as a disclaimer to the quality and reliability of the analytical results of their investigation."

Response:

Section 10.0 of the RI does not offer a "disclaimer to the quality and reliability of the analytical results..."; this section discusses the bounds of reasonable extrapolation and limitations imposed by the data assimilated from this and prior investigations at the site. As with any scientific study, findings and conclusions can only be drawn from valid datapoints, and reasonably extended from representing a specific situation to characterizing a general finding. With increased datapoints, reliability is increased through repetitive, replicating data; i.e., the hypothesis is verified. Broader-based data also extends the ability to laterally extrapolate general findings with a reasonable assurance of accuracy. This discussion of scientific method is addressed for the FLR Landfill RI/FS in Section 10.3: Qualifications on the Remedial Investigation, the first paragraph of which follows:

"Any site investigation is based upon a limited amount of data, from which judgment must be applied in order to characterize the site. Every investigation could generally benefit from the collection of additional field data, in the form of additional test borings, monitoring stations, analytical data points, etc., but this is neither practical nor cost effective. With this understanding, reasonable and prudent judgment must be utilized in assessing the data available. Therefore, while additional data would be useful in verifying the conclusions in this remedial investigation, the level of data has been sufficient to draw reasonable conclusions. However, in examining these conclusions, it is prudent to appreciate the reliability of the results; therefore, several qualifications of the remedial investigation are presented in this section."

This section of the RI was incorporated in the interest of full disclosure of the basis upon which conclusions were drawn during the FLR Landfill RI/FS. No statement is intended to imply that the conclusions presented in the RI/FS are not supported by the data collected, or that the

Table 1: Domestic Well Locations

<u>Sample Identification</u>	<u>Owner/ Residence</u>	<u>Location of Point Source</u>
GW-DW09	Vorrell	Front faucet on right side.
GW-DW10	Roche	Faucet on rear side.
GW-DW11	Roche	Faucet on left side of garage.
GW-DW12	Horton	Faucet on rear, near porch.
GW-DW14	Burnett	Faucet in rear.
GW-DW16	Conlov	Faucet in rear on right.
GW-DW17	Moska	Open well in front yard.
GW-DW19	Lovenduski	Hose faucet on south side.
GW-DW22S	Marshall	Faucet in rear on right side.
GW-DW22D	Marshall	Dug well (cistern) in yard on right side.
GW-DW50	Miller	In a shed laundry spigot.
GW-DW51	Freck	Faucet in rear on left side.
GW-DW52	Hall	Faucet on south side.
GW-DW53	Cummings	Utility sink in garage.
GW-DW54	Meise	Faucet in front.
GW-DW55	Rule	Faucet in front on left side.
GW-DW56	Neindorf	Dug well (cistern) in front yard.
GW-DW57	Commercio	A line from a 50-gallon holding tank.
GW-DW58	Maragalino	In house, bathroom faucet.
GW-DW59	Potts	Faucet in rear on right.

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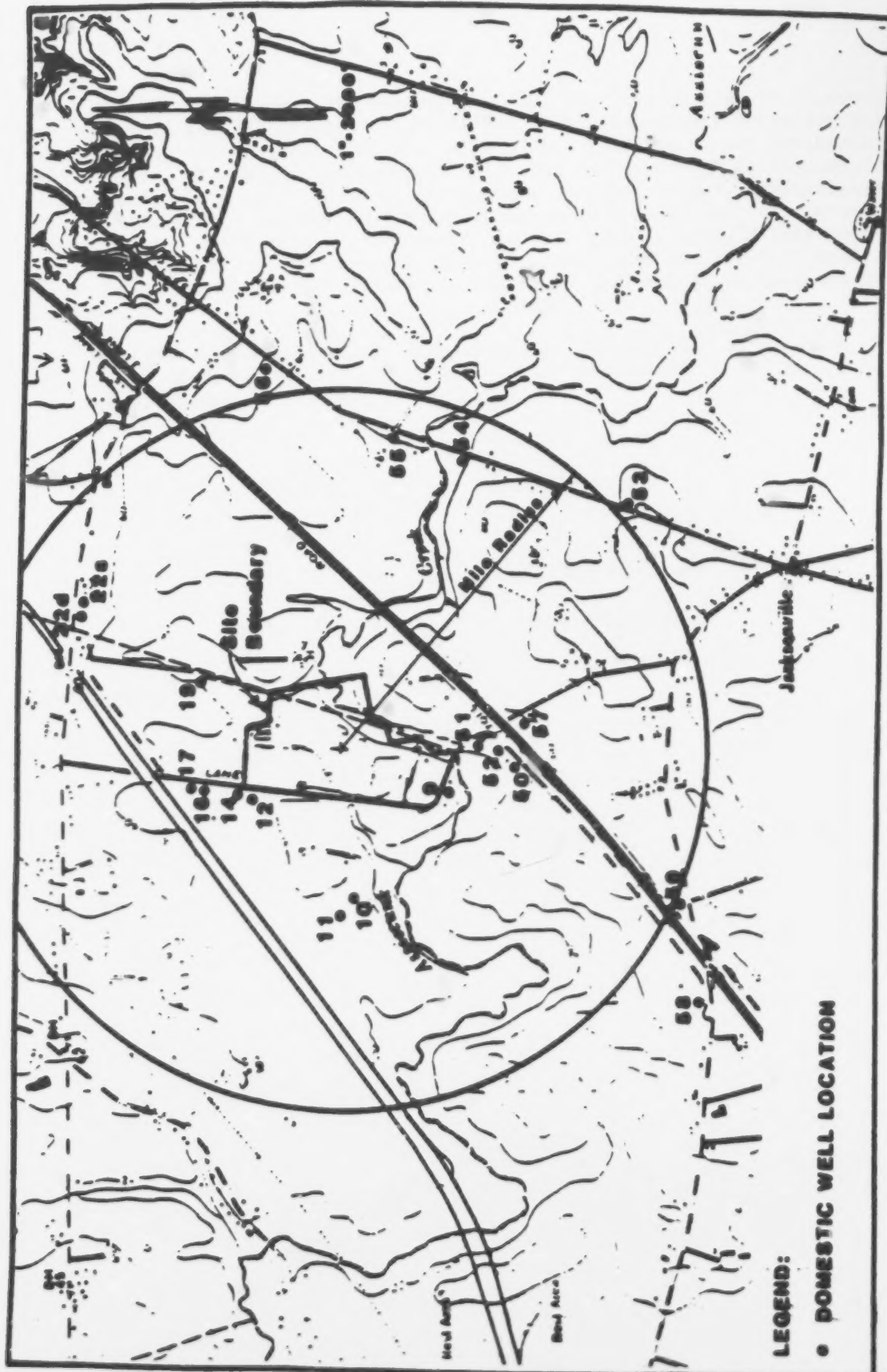
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study findings are not reasonable interpretations based upon the data developed. The laboratory data qualifications do, however, present limitations, or gaps, which should be eliminated by supplemental information to be collected to verify and reconfirm the data upon which remediation decisions have been made. The acquisition of this supplemental information was subsequently addressed in the feasibility study as a design, implementation, and operational requirement for broad-based monitoring programs.

General Comments

The conclusion of DRAI is that "the RI/FS is deficient in its treatment of the impact on regional hydrogeology, water resources, and water quality". In support of this opinion, "a cursory evaluation as conducted by DRAI of the regional hydrogeology and its interaction with the FLR is presented in (as) Attachment I". Attachment I, entitled "Preliminary Interpretation of the Regional Hydrogeology in the Vicinity of the FLR Landfill", summarizes existing well data collected from a records search for wells in Mansfield Township. These wells exhibit a geographic centroid at a distance of approximately 2.25 miles from the FLR Landfill site. Three wells in Florence Township, near the township line, and 3 deep wells on the FLR landfill site, installed during the 1982 Geraghty & Miller investigation are also incorporated. Two concentrations of these wells are addressed as a focus of the study; one west of Columbus, at an approximate distance of closest approach of 1.4 miles from the FLR Landfill site, and the other in Columbus, at an approximate distance of 2.6 miles from the site. While definite boundaries cannot generally be defined for the area of influence of a facility such as the FLR Landfill, a 1.0-mile distance is considered reasonable. This radius from the FLR Landfill, and the domestic wells surveyed within that approximate boundary during the RI/FS, are presented on Figure 1. It should be noted that only 4 of the DRAI domestic wells fall within the 1.0-mile boundary.

The DRAI "cursory evaluation" further presents isopleth mapping of the "shallow aquifer ground-water elevation", the "deep aquifer potentiometric surface elevation", and the "elevation of top of Woodbury Formation". These interpretations are based upon the domestic well data presented previously. These interpretations may indeed be reasonable and representative of the study area; however, the study area only peripherally includes the FLR Landfill. The shallow aquifer map is based upon an effective total of 5 data locations, only one of which is within 1.0-mile of the FLR Landfill site. Extrapolations of the ground-water surface in the vicinity of the FLR Landfill are therefore without adequate basis. While flow is indicated across the FLR Landfill site toward the northwest, conflicting data from the RI/FS and other sources near the site have not been incorporated, as is evidenced by equipotential lines with an elevation of +40 feet, mean sea level (msl) datum crossing Assiscunk Creek at a point where the free surface-water elevation in the creek is approximately elevation +15 feet msl. In general, the development of a ground-water surface map for this large area based upon 5 data points is not reasonable, particularly since the surface is, in large measure, topographically controlled.



LEGEND:

• DOMESTIC WELL LOCATION

DOMESTIC WELL SAMPLING LOCATIONS

Florence Land Recontouring Landfill

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Engineers Architects

Figure 1

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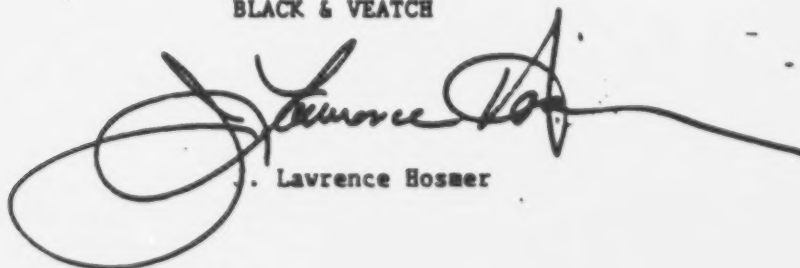
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The DRAI potentiometric surface map for the deep aquifer is in essential accord with the conclusions of the RI/FS. Since a Woodbury Formation surface isopleth was not prepared for the RI/FS, no comparisons are appropriate in this regard. Therefore, in summary, while the DRAI data and interpretation in those areas which have adequate datapoints may be correct, extrapolation of this information beyond the fringe of the study area is not warranted, and therefore not reliable. As evidenced above, such extrapolations represent conjecture at best. The interpretation of the shallow aquifer flow aside, the " cursory evaluation " is considered to support the overall conclusions of the RI/FS.

We trust these responses are adequate within the given time-frame; additional discussion is available if so warranted. If you have any questions, please do not hesitate to contact us.

Very truly yours,

BLACK & VEATCH

A large, stylized handwritten signature in black ink, appearing to read "J. Lawrence Hosmer". The signature is fluid and cursive, with a long horizontal line extending to the right.

J. Lawrence Hosmer

seb
Attachments



State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT

HAZARDOUS SITE MITIGATION ADMINISTRATION
CN 028, Trenton, N.J. 08625

MARWAN M. SADAT, P.E.
DIRECTOR

JORGE H. BERKOWITZ, PH.D.
ADMINISTRATOR

14 May 1986

MEMORANDUM

MAY 13 1986

TO: BETH MUHLER, Site Manager, BSM

THROUGH: MARJA VAN OUMERKERK, Assistant Chief, BEERA *mv*

FROM: ANNE DECICCO, Technical Coordinator, BEERA *AD*

SUBJECT: FLORENCE LAND RECONTOURING LANDFILL: QUALIFICATIONS ON THE RI/FS DATA

As you are aware, finalization of the Remedial Investigation/Feasibility Study for the subject site has been delayed due to the numerous laboratory quality assurance issues surrounding the chemical analytical results of this study. ETC Corporation performed the majority of the analytical work on this project. On April 9, 1986, a meeting was held to discuss these quality assurance issues with representatives from NJDEP, Black & Veatch (prime contractor) and ETC Corporation in attendance. During the meeting, ETC was presented with a list of outstanding quality assurance items to address, which had been prepared by Tien-Nye Vaccari of the DWM - Office of Quality Assurance. These items were presented to ETC in anticipation that ETC could provide additional information in order to reduce the number and type of qualifications on some of the data. Through an April 24, 1986 letter to Lawrence Hosmer, B&V, ETC provided a response to these items. Based on a review of the ETC response with Ms. Vaccari, OQA (in a meeting on May 5, 1986), the final qualifications on the analytical results for this site were outlined and are provided in Attachment 1. Air data has not yet been submitted for review, therefore, it has not been included here.

As a forward comment, the outstanding QA issues primarily include exceedance of sample holding time for volatile organic and base/neutral extractable fractions in some of the samples and trip/field blank contamination (methylenechloride and Phthalates).

In general, the data provide a good representation of the quality of the matrices sampled, however, due to the qualifications noted in Attachment 1, in some cases, the contaminant values reported are not exact.

Attachment 1

Provided below are non-correctable quality assurance issues which have resulted in usable yet qualified data:

Batch 1 -- Surface Water and Sediment Samples

For surface water samples, all data are acceptable except for the acid extractable fraction of SW-04-01. It should be noted that SW-03-02 was also unacceptable, however, a duplicate of this sample, SW-03-02, has been validated and is therefore usable.

For the sediment samples, the following problems remain unresolved, thereby resulting in a high qualification of the data.

<u>PROBLEM</u>	<u>SAMPLES AFFECTED</u>
a. VO exceeded holding times (~25 days)	SSE-07-01, SSE-02-02, SSE-02-01, SSE-01-01; SSE-04-01
b. B/N/A exceeded holding times (1 month)	Same as above.
c. Method blank contamination (phthalates)	Same as above.
d. Wrong method for TCDD analysis	SSE-02-01, SSE-01-01, SSE-03-01

Batch 2-7, 15 -- Soil Samples/Borings 4,5,6

All data are acceptable, however, several problems are noted below, therefore, the data is qualified.

<u>PROBLEM</u>	<u>SAMPLES AFFECTED</u>
a. VO exceeded holding times (~24 days)	SSO-804-02 XFB-0910-5 SFB-0912-5
b. B/N/A exceeded holding times	SSO-804-02 SSO-804-03 SSO-804-04
c. Contaminated FB & TB (MCl)	Batch 2,4,5

Regarding methylene chloride (MCl) contamination in the trip and field blanks, this problem was project-wide and should be addressed as an overall forward comment when describing the results of this study.

- d. Internal standard not detected in
method blank

XTB-0910-S
SFB-0912-S
STB-0912-S

Batch 19 -- Shallow Monitoring Wells BV-45, 55, 65

All data are acceptable, however, the following problems are noted:

<u>PROBLEM</u>	<u>SAMPLES AFFECTED</u>
a. VO exceeded holding times	WFB-1120-W WFB-1120-W
b. Surrogate recovery outside of limits	WFB-1120-W WTB-1120-W WGW-BV45-01

Batch 20 -- Monitoring Well BV-40 and GM-45

All data are acceptable, however, the following problem is noted:

<u>PROBLEM</u>	<u>SAMPLES AFFECTED</u>
a. Contamination in TB & FB (phthalates)	FB-1125-W TB-1125-W

Batch 21 -- Monitoring Wells BV-50, 60

All data are acceptable, however, the following problems are noted:

<u>PROBLEM</u>	<u>SAMPLES AFFECTED</u>
a. VO exceeded holding times (1-2 days)	WGW-BV50-01 WGW-BV60-01 WTB-1125-W (7 days)
b. Contamination in TB & FB (MC1 & phthalates)	WTB-1125-W WFB-1125-W

Batch 22 -- Waste-fill Monitoring Wells BV-15, 25, 35

All data are acceptable, however, the following problems are noted:

<u>PROBLEM</u>	<u>SAMPLES AFFECTED</u>
a. B/N/A exceeded holding times	WGW-BV15-01
b. Surrogate recovery outside of control limits... (attributed to sample matrix)	WGW-BV15-01 WGW-BV15-01R WGW-BV35-01R

Batch 24 -- Domestic well samples (11 total) plus GM-40

All data are acceptable, with the exception of the VO fraction for 6 wells which had exceeded holding times. These wells have been resampled and analyzed for VOs only and are also acceptable.

PROBLEM

- a. VO exceeded holding times (6-7 days)

SAMPLES AFFECTED

WGW-DW17-02
WGW-DW22D-02
WGW-DW16-02
WGW-DW55-02
WGW-DW54-02
WGW-DW56-02
WTB-1210-W

With regard to the resampled potable wells, only a Tier II data package was submitted to NJDEP. All the backup information required for a Tier I package will have to be submitted in order for these sample results to be approved.

Batch 25 -- Domestic wells

All data are acceptable except for the VO fraction of WGW-09-02. However, since this sample had a duplicate, WGW-09-03, which was accepted, no serious qualifications have resulted.

Batch 8, 13, 16, 18 Soil Samples

All data are acceptable, however, VO holding times were exceeded (13 days) for Batch 8. Since these are soil samples, the results are acceptable yet qualified.

HS68/km

c: Dr. Merry Morris
Tien-Nye Vaccari, OQA

Attachment A

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
HAZARDOUS SITE MITIGATION ADMINISTRATION

Public Meeting
on
Commencement of
Remedial Investigation/Feasibility Study
Focus Feasibility Study
at the
Florence Land Recontouring Landfill Site
Florence, Mansfield and Springfield Townships
Burlington County
Thursday, May 2, 1985
7:00 p.m.
Florence Township Memorial High School
Auditorium
Front Street
Florence, NJ

AGENDA

- | | |
|--|---|
| 1. Opening Remarks;
Introduction of NJDEP personnel | Dr. Jorge H. Berkowitz,
Administrator
Hazardous Site Mitigation Administration
NJDEP |
| 2. Community Input | Ms. Grace L. Singer, Chief
Office of Community Relations
NJDEP |
| 3. Overview of Past History
and Current Situation;
Introduction of Contractor:
Black and Veatch Engineers -
Architects | Ms. Beth Muhler, Site Manager
Bureau of Site Management
NJDEP |
| 4. Presentation: Remedial
Investigation/Feasibility
Study | Mr. Lawrence J. Hosmer,
Project Officer
Black and Veatch Engineers - Architects |
| 5. Questions and Answers | |



STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

FACT SHEET

on

Commencement of
Remedial Investigation/Feasibility Study
Focus Feasibility Study
at
Florence Land Recontouring Landfill Site
Florence, Mansfield and Springfield Townships
Burlington County
May 2, 1985

Site Description:

The Florence Land Recontouring Landfill, covering 29 acres in a mixed residential and agricultural area, was operated as a disposal facility from 1973 until 1981. During this time, the landfill was permitted to accept sanitary and industrial waste, including septage and sewage sludge. (For approximately one year during this period, the site was identified as JEMS and operated by Jersey Environmental Management Services.)

Although a leachate collection system exists at the site, excessive levels of leachate have been found within the landfill. Surficial leachate seeps have been observed near the banks of the Assicunk Creek which is used for recreation and irrigation. Ground water sample results indicate the presence of volatile organic compounds in the shallow aquifer. There is a possibility of contamination in the deeper Magothy-Raritan aquifer, which is the primary ground water source for the local community. Similarities of chemical constituents were found in the landfill leachate and in some private wells. There are approximately 16 public wells and over 1,800 private wells within a three mile radius of the site. Preliminary air monitoring has indicated the presence of volatile organics emanating from manholes and monitoring wells at the landfill. Vents equipped with carbon filters were installed in order to control air emissions; however, there is some question regarding the adequacy of these measures.

Background

A Consent Judgement was issued by the New Jersey Superior Court in January, 1979 to close the landfill. In July, 1981 Florence Land Recontouring submitted a closure plan and the operation terminated in November, 1981.

A Cooperative Agreement was signed by the United States Environmental Protection Agency and the New Jersey Department of Environmental Protection on March 28, 1984, providing funds in the amount of \$434,225 to conduct a Focus Feasibility Study and a Remedial Investigation/Feasibility Study (RI/FS).

Of 97 New Jersey sites on the National Priorities List, the Florence Land Recontouring Landfill site is ranked 10th in priority.

over...

What is "Superfund"?

Superfund is the common name for the Comprehensive Environmental Response, Compensation and Liability Act enacted by Congress in December 1980. The Act authorized the United States Environmental Protection Agency (USEPA) to provide long-term remedies at hazardous waste sites. The Act established a \$1.6 billion fund, raised over five years (ending in 1985) from special taxes and general revenues, to accomplish the cleanup of these sites.

What is the National Priorities List (NPL)?

The NPL is a list of the highest priority releases or potential releases of hazardous substances, based upon State and EPA Regional submissions of candidate sites and the criteria and methodology contained in the Hazard Ranking System (HRS), for the purpose of allocating funds for remedial response. Published by USEPA, the NPL is updated periodically.

What is a remedial investigation?

A remedial investigation involves field activities for collecting information to make decisions in controlling contaminants. The investigation usually includes sampling and analysis of ground water, surface water, soils, and other natural and man-made substances for the presence of contaminants.

What is a feasibility study?

A feasibility study is an evaluation of alternative remedial measures for controlling the contaminants and selection of the most appropriate alternative.

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WASTE MANAGEMENT

HAZARDOUS SITE MITIGATION ADMINISTRATION

A Community Relations Program at Superfund Hazardous Waste Sites

As part of the federal/state program of cleanup at hazardous waste sites, a Community Relations Program is conducted to receive local input and to advise local residents and officials about the planned remedial actions at the three major stages of the cleanup: 1) remedial investigation/feasibility study 2) engineering design and 3) removal/treatment/construction. Local briefings and meetings are conducted with elected officials and residents and generally take place at:

- 1) The commencement of a remedial investigation/feasibility study so that local concerns can be addressed early in the process.
- 2) The completion of a feasibility study to discuss the alternative courses of remedial action. There is a 30-day comment period after public presentation of the alternatives during which the feasibility study is available in local repositories.
- 3) The engineering design stage to carry out the mandates of the selected remedial alternative.
- 4) The commencement of the removal/treatment/construction stage to advise of the expected physical remedial action.
- 5) The completion of the remedial action.

In addition to the activities outlined above, there is generally ongoing communication with local officials and residents as required. Depending upon whether the New Jersey Department of Environmental Protection (DEP) or the United States Environmental Protection Agency (EPA) has the lead in remedial action at a site, community relations activities are conducted by the relevant State or Federal agency.

In New Jersey, the DEP Community Relations Program is directed by Grace Singer, Chief, Office of Community Relations (609) 984-3081. At Region II, EPA, the contact person is Lillian Johnson, Community Relations Coordinator (212) 264-2515.

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STEPS INVOLVED IN A MAJOR HAZARDOUS WASTE SITE CLEANUP

(1)	(2)	(3)	(4)
Site Identified and Referred	Initial Site Investigation	Secure Site	Site Analysis Evaluation and Assessment
(5)	(6)	(7)	(8)
Prioritization	Determination of Lead	Community Relations Plan Activated	Signing of Contractor Cooperative Agreement
(9)	(10)	(11)	(12)
Hiring of Contractor for Remedial Investi- gation/Feasibility Study	Preparation of Feasibility Study	Selection of Remedial Action Alternative	Hiring of Contractor for Engineering Design
(13)	(14)	(15)	
Hiring of Construction/ Removal Cleanup Contractor	Cleanup Evaluation	Contractor Audit and Close out	

Attachment B

Attachment B

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 DIVISION OF WASTE MANAGEMENT
 HAZARDOUS SITE MITIGATION ADMINISTRATION
 Public Meeting to Discuss Commencement of
 Remedial Investigation/Feasibility Study
 at
 Florence Land Recontouring Landfill Site
 Florence, Mansfield and Springfield Townships
 Burlington County
 Thursday, May 2, 1985

NAME	AFFILIATION	ADDRESS
1. Gail Ryan	Bordentown Reg	Box 190 Rt 206 Columbus
2. Susan Kobylarz	Register - News	PO Box 189, Bordentown
3. Hainet Ledy	3	Cedar La. RD1 Bordentown
4. Victor/Florence Vanzo	Washington CT	RR2 Box 113 Columbia
5. William J. Carty		Box 510 Columbia Bus N.J.
6. Mary A. Anttard		979 Wallace Ave, Hightstown
7. Daniel C. Cram	managers TD	Strom. 112 Rd Wrightstown N.J.
8. Dorothy Gluck	Vice-Chairman Mansfield Twp Exec. Comm.	Rt 206 Columbus
9. Robert R. Hight	HA45K164 F-B	RR1 Box 3030 Columbia
10. Maureen Barrett	Homeowner	Paul. - Columbus Rd. P.O.
11. Emily V. De Vecchio	Advisory Bd Mansfield Twp.	W. Main St. RR2 Box 1 Columbus, N.J. 08055
12. Scott Schwarz	Wissner & Schwarz	900 Seventeenth Street, Washington, DC
13. W.F. Ryan Jr.	Twp of Florence	Mun. Complex Broad St Florence NJ 08535

NAME

AFFILIATION

ADDRESS

14. OLDER JOEL 2037 CEDAR H. EXT. HANCOCK LER
15. Alder Juelite 2037 Cedar H. EXT. HANCOCK LER
16. Charles Bauer Burlington Columbus Co
- ✓ 17. Rita Casaral 25 Laurel Ave.
18. Henry N. Kibbey 249 Wilbur Henry Dr.
Florence N.J. 08518
19. Virginia Ernest Romerover 140 Coachman's Dr. #01
Bordentown, N.J. 08505
20. Becky Glass 22 West 5th St. Florence, N.J. 08505
21. Cathy Bauer 208 Ext 8th Street Florence N.J. 08505
RD#1 N.J. 08505
22. Hemanshu Patel 17 Knight's Court Bordentown
23. Amy Glass 22 West 5th St. Florence, N.J. 08505
24. John Smith 10 Boulevard, Florence, N.J.
25. (cont. next page)
- 26.
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	NAME	AFFILIATION	ADDRESS
25. 105.	MARTIN T. MOGAN		
106.	Sw Mogan		Jacksonville Rd. Borden Town
107.	John Hofflinger		114 SIXTH AVE ROSELAND N.J.
108.	Otto Andersen		2104 Old York rd Burlington
109.	Robert Hoffman		RD1 Box 2406 Borden Town
110.	Harold Drees		Box 456, FURNITURY HJ
111.	William Hollings		111 Second Ave Roeblyng.
112.	Roni Morgan		Solicitor, Mansfield Twp
113.	Sharon A. Antland		979 Wallace Ave. Roeblyng
114.	R. Brough		Island Rd Columbus, N.J.
115.	William M. Dawson		Rt. 206 Columbus N.J.
116.	Wonna G. Cannon		RR1 Box 173 Columbus N.J.
117.	Dan Ruvix	DD Ruvix Assoc.	588 Eagle Rock Av. West Orange NJ 07093
118.	Bill W. LKINS	Municipal Attorney	Florence Twp
119.	SHARON A. WARRER	Mayor	" "
120.	George W. EMMERICK	Council President	" "
121.	Mrs. & Mrs. John Tumash		761 E. 2nd St, Florence
122.	L.C. BOYD, JR.	INDUSTRIAL ADVISORY	FLORENCE TWP PO BOX 1 FLORENCE N.J.
43 223.	G.H. WALTERS,		Florence-Columbus Rd, 20, Borden Town 08505

NAME

AFFILIATION

ADDRESS

44.	~~124.~~ Gordon Reader	189 Grayson Ave. Muscoville
125.	~~125.~~ Tom R	342 E. FRONT ST.
126.	~~126.~~ Robert L. Smith	Bush Co. Off. of WASTE MANAGEMENT
127.	~~127.~~ Dan Carson	25 Linton Ave. Florence
48.	~~128.~~ Barbara A. Smith	317 W. Second St. Florence
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Attachment C

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS SITE MITIGATION

Public Meeting
on
Completion of
Remedial Investigation/Feasibility Study (RI/FS)
at
Florence Land Recontouring Landfill Site
Florence, Mansfield and Springfield Townships
Burlington County
Thursday, June 12, 1986
7:30 P.M.
Fountain of Life Center
Columbus & Old York Roads
Florence, NJ

AGENDA

- | | |
|--|--|
| 1. Opening Remarks;
Introduction of NJDEP Personnel
and Contractor:
Black & Veatch/Engineers-Architects | Mr. Anthony Farro, Assistant Director
Division of Hazardous Site Mitigation |
| 2. Community Input | Ms. Grace L. Singer, Chief
Office of Community Relations
Division of Hazardous Site Mitigation |
| 3. Overview of Past History
and Current Situation | Ms. Beth Muhler, Site Manager
Bureau of Site Management
Division of Hazardous Site Mitigation |
| 4. Presentation:
Remedial Investigation/
Feasibility Study | Mr. Lawrence J. Hosmer, Project Officer
Black and Veatch/Engineers-Architects |
| 5. NJDEP Recommended
Alternative | Mr. Robert Predale, Chief
Bureau of Site Management
Division of Hazardous Site Mitigation |
| 6. Comments and Questions | The floor will be open for comments
and questions at this time. |



STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Fact Sheet
on
Completion of
Remedial Investigation/Feasibility Study
at
Florence Land Recontouring Landfill
Florence, Mansfield and Springfield Townships
Burlington County
June 12, 1986

Site Description: The Florence Land Recontouring Landfill (FLR) is an inactive site covering 29 acres in a mixed residential and agricultural area where Florence, Mansfield and Springfield Townships merge. FLR operated as a licensed municipal landfill from November 1973 until November 1981. During this time, the landfill was permitted to accept sanitary and industrial waste including septage and sewage sludge. (For approximately one year during this period the landfill was identified as JEMS and was operated by Jersey Environmental Management Services.)

Although a leachate collection system exists at the site, concern about the system's adequacy has been expressed through the years. Surface leachate seeps have been observed sporadically near the banks of the Assicunk Creek which is used for recreation and irrigation. Ground water sample results have indicated on-site contamination by volatile organic compounds in the shallow Pleistocene Aquifer. The potential for contamination of the deeper Magothy-Raritan Aquifer, which is the primary local ground water source, has also been a concern. The largely rural/agricultural area contains approximately 16 public potable wells and over 1,800 individual potable wells within a three-mile radius of the site.

Air monitoring has indicated the presence of volatile organic gases emanating from manholes and monitoring wells at the landfill. Vents equipped with carbon filters were installed by Florence Land Recontouring, Inc. in order to control air emissions; however, there is some question regarding the adequacy of these measures due to lack of ownership maintenance.

Background: A Consent Judgement was issued by the New Jersey Superior Court in January 1979 to close the landfill due to the site's history of environmental problems. Florence Land Recontouring, Inc. terminated operations in November 1981.

A Cooperative Agreement was signed by the United States Environmental Protection Agency (USEPA) and the New Jersey Department of Environmental Protection (NJDEP) on March 28, 1984 providing funds in the amount of \$442,445 to conduct a Focus Feasibility Study and a Remedial Investigation/Feasibility Study (RI/FS).

Status: A Draft Feasibility Study was completed in May 1986 and the remedial action alternatives are presently being evaluated by NJDEP and USEPA. The public comment period, ending on June 23, was announced on May 19, 1986. The Draft Feasibility Study has been available since May 19 at the following repositories:

II. Summary of Feasibility Study Results:

A. Principal Remedial Response Objectives :

- Mitigate downgradient, off-site ground water contamination.
- Mitigate off-site, surface water run-off contamination.
- Mitigate off-site, air contamination.
- Mitigate the potential for health hazard exposure.

B. Principal Remedial Alternatives for Long-Term Site Remediation:

Alternative 1 - No action except to complete the implementation of Initial Remedial Measures (fencing and continued long-term environmental monitoring program).

Alternative 2 - Upgrade and refurbish surface water run-off controls; improve the leachate management system; replace carbon filters on manholes and maintain these, as required; remove on-site debris and structures and continue the long-term environmental monitoring program.

Alternative 3 - Incorporates a leachate management system similar to Alternative 2, with the addition of a circumferential slurry barrier wall; the installation of a composite synthetic membrane/clay cover; the installation of a new surface water control system; use of a passive gas collection system and continue the long-term environmental monitoring program.

Alternative 4 - Use of the current leachate management system, augmented with extraction wells for leachate removal; off-site disposal of leachate; installation of a new synthetic cap over the wastefill; improvement of the surface water run-off system; use of an active gas extraction system with disposal at the Burlington County Solid Waste Management Facility Complex and continue the long-term environmental monitoring program.

Alternative 5 - Alternative 5 is similar to Alternative 4 with the addition of a partial slurry wall along the upgradient side of the wastefill (to reduce leachate quantities generated).

Alternative 6 - Alternative 6 is similar to Alternative 5 with the addition of on-site pretreatment of leachate and the implementation of an on-site incineration facility.

Alternative 7 - Alternative 7 is similar to Alternative 6 with the addition of a complete leachate treatment system; it incorporates the partial slurry wall of Alternatives 5 and 6 and incorporates both on-site leachate and gas treatment plants.

For further information, or if you have any questions, contact Jeffrey Folmer of NJDEP's Office of Community Relations at (609) 984-3081.

Glossary of Terms

Administrative Consent Order (ACO): A binding legal document between a government agency and a responsible party. It is issued by the government in the form of an order that specifies site mitigation activities to be undertaken by the responsible party.

Contract: The legal agreement that outlines federal and state government responsibilities at USEPA-lead sites on the National Priorities List (Superfund sites) as authorized by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Cooperative Agreement: An agreement whereby USEPA transfers funds and other resources to a state for the accomplishment of certain remedial activities at sites on the National Priorities List (Superfund sites) as authorized by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Engineering Design (Remedial Design): Following a feasibility study, an engineering design is executed to translate the selected remedy in accordance with engineering criteria in a bid package, enabling implementation of the site remedy.

Focused Feasibility Study (FFS): A limited feasibility study which is performed on a certain aspect of site remediation and/or when more than one remedial measure is considered technically viable for the immediate control of a threat.

Immediate Removal Actions (IRAs): Actions taken to prevent or mitigate immediate and significant risk to human life, health or to the environment.

Initial Remedial Measures (IRMs): Actions that can be taken quickly to limit exposure or threat of exposure to a significant health or environmental hazard at sites where planning for remedial actions is underway.

Monitoring Well: A well installed under strict design specifications that, when sampled, will reveal hydrogeologic data at its point of installation. Monitoring wells are installed at predetermined locations, usually in groups, to gain knowledge of site conditions including: extent and type of ground water contamination, soil types, depth to ground water and direction of ground water flow.

National Contingency Plan (NCP): The basic policy directive for federal response actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). It sets forth the Hazard Ranking System and procedures and standards for responding to releases of hazardous substances, pollutants, and contaminants. The NCP is a regulation subject to regular revision.

National Priorities List (NPL): A list of the highest priority releases or potential releases of hazardous substances, based upon

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WASTE MANAGEMENT

HAZARDOUS SITE MITIGATION ADMINISTRATION

A Community Relations Program at Superfund Hazardous Waste Sites

As part of the federal/state program of cleanup at hazardous waste sites, a Community Relations Program is conducted to receive local input and to advise local residents and officials about the planned remedial actions at the three major stages of the cleanup: 1) remedial investigation/feasibility study 2) engineering design and 3) removal/treatment/construction. Local briefings and meetings are conducted with elected officials and residents and generally take place at:

- 1) The commencement of a remedial investigation/feasibility study so that local concerns can be addressed early in the process.
- 2) The completion of a feasibility study to discuss the alternative courses of remedial action. There is a 30-day comment period after public presentation of the alternatives during which the feasibility study is available in local repositories.
- 3) The engineering design stage to carry out the mandates of the selected remedial alternative.
- 4) The commencement of the removal/treatment/construction stage to advise of the expected physical remedial action.
- 5) The completion of the remedial action.

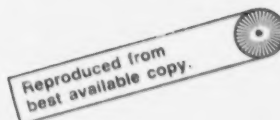
In addition to the activities outlined above, there is generally ongoing communication with local officials and residents as required. Depending upon whether the New Jersey Department of Environmental Protection (DEP) or the United States Environmental Protection Agency (EPA) has the lead in remedial action at a site, community relations activities are conducted by the relevant State or Federal agency.

In New Jersey, the DEP Community Relations Program is directed by Grace Singer, Chief, Office of Community Relations (609) 984-3081. At Region II, EPA, the contact person is Lillian Johnson, Community Relations Coordinator (212) 264-2515.

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Over.

Attachment D



NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS SITE MITIGATION

Public Meeting to Discuss
Completion of
Remedial Investigation/Feasibility Study

at
Florence Land Recontouring Landfill
Thursday, June 12, 1986
7:30 P.M.
Fountain of Life Center
Columbus & Old York Roads
Florence, NJ

PLEASE PRINT

NAME	AFFILIATION	ADDRESS
1. CHIEF JAMES M Humble		11#2 Box 51A Columbus NJ 0801
2. ALBERT ROSS		Box 156A Columbus, NJ 0801
3. Dugan Kovacs		74 E Delaware Ave Florence NJ
4. Lester J Godbois		3-974 Ave, Roebling NJ
5. Simone B Godbois	" "	" " " "
6. Albert R Haines Jr		RD 1 Box 230 DI Jackson NJ
7. Robert J Madoff		RD 1 Box 240E BORDENTOWN N.J.
8. Paul Bowlin		P.O. Box 457 Burlington NJ
9. John Hofflinger		114 SIXTH AVE ROEBLING NJ
10. Bill & Ruth Mehler		107 York Ave. Columbus, N.J. 0.
11. Juan & Linda HOLGADO		16 KING'S COVE RD 101 BORDENTOWN NJ 0.
12. Thomas C. Boyd Jr		331 W Front Street
13. Andrew Higgins		Rt 105 Egg Co Mount Holly

-2-

PLEASE PRINT

	<u>NAME</u>	<u>AFFILIATION</u>	<u>ADDRESS</u>
14.	<i>Margaret Blaise Smith</i>		<i>Columbus, N.J.</i>
15.	<i>Michael Lickore</i>		<i>Lockington, N.J. 0851</i>
16.	<i>Georg Emsch</i>		<i>Flumen Ter Canal</i>
17.	<i>Susan Leonard</i>		<i>Columbus N.J.</i>
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NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS SITE MITIGATION

Public Meeting to Discuss
Completion of
Remedial Investigation/Feasibility Study

at
Florence Land Recontouring Landfill
Thursday, June 12, 1986
7:30 P.M.
Fountain of Life Center
Columbus & Old York Roads
Florence, NJ

PLEASE PRINT

NAME	AFFILIATION	ADDRESS
1. ~~James J. Kunkle~~	~~Manifield Twp~~	~~Box 236-B, Bordentown NJ 08505~~
2. WARREN E LIPKA	PURE	1300 COACHMAN'S DR RD#1 BORDENTOWN NJ 08505
3. ~~John R. Puccio~~	~~Manifield Twp~~	~~Box 236 Columbus NJ~~
4. Barbara Crammer	Manifield Twp	PO Box 158 Columbus
5. ~~James P. Larkins~~		RD 2 Box 142 Columbus
6. ~~Paul J. Larkins~~		CC 1 Box 361 Columbus NJ 08505
7. Nola S Vondy		439 E Front St. Florence
8. MARTIN PINSOTT		Box 352 J. L. TOWN NJ 08505
9. Emily V Del Vecchio		Box 139 W. Main St. Mansfield Township Columbus, NJ Citizen Advisory
10. ~~Barbara Davis~~		PO Box 30 W. Main St. Mansfield Township Columbus NJ Citizen Advisory
11. Amy Jaramila		RD 2 Box 299 Columbus NJ
12. ~~Donald L. Jaramila~~		215-C JACKSON JACK HEDDEN & BORDENTOWN, N.J. 08505
13. ~~Karl Karpas~~	~~Florence - Columbus NJ~~	~~PO Box 204 Ruckling, NJ 08505~~



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| 14. | Marlene Shaw | | 26.2 Columbia Rd |
| 15. | Larry Shaw | | " " " |
| 16. | Clara Smeyers | | RR2 Box 302 Columbia |
| 17. | Fan Smeyers | | " " " |
| 18. | Barbara & Frank Jackson | | Bush Rd Bordentown NJ |
| 19. | W.K. Bordentown | | 12 FNTN BLVD TRD 2 BURLINGTON |
| 20. | Robert F. Scheller | | Box 226B Bordentown, N.J. 08505 |
| 21. | Dr & Mrs Ken Baldwin | | 14 Fountain Blvd, Burlington, N.J. 08616 |
| 22. | Harriet Leedy | | 2025 Cedar St. RD1 Bordentown |
| 23. | Jean & James Plone | | RR2 Box 78 Columbia |
| 24. | Dana Paykos | | Florence Twp Environmental Comm. 17 Riverbank Dr Reebing, NJ 088 |
| 25. | De Blaise | | Columbia 119 |
| 26. | Gordon Reeder | | 189 Grayson Ave Mercerville NJ |
| 27. | John & Sylvia Pithas | | Jacksonville Hedding Rd NJ |
| 28. | William Holloway | | Florence Twp 111 Second Ave R |
| 29. | Perie Lacombe | | Florence NJ 1010 5th St |
| 30. | Dan Lavin | | Lavin Assoc./Florence - Manstead Finance 5 Central Ave W. Orange NJ 07052 |

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS SITE MITIGATION

Public Meeting to Discuss
Completion of
Remedial Investigation/Feasibility Study

at
Florence Land Recontouring Landfill
Thursday, June 12, 1986
7:30 P.M.
Fountain of Life Center
Columbus & Old York Roads
Florence, NJ

PLEASE PRINT

NAME	AFFILIATION	ADDRESS
1. Nancy Nutt		PO Box 8 Columbus, N.J. 08022
2. Ann Kucharczyk	Mans. Twp. Env. Comm.	Island Rd. Columbus NJ 08022
3. JOE DISTEFANO	NJCA	PO BOX 118 WOODBURY 08096
4. Anna Norris		2054 Old York Rd. Burlington NJ 08011
5. Leona SKORIAK		2056 Old York Rd. Burlington NJ 08016
6. CHARLENE HARGAR	RO+1 BOX 215 J.	JACKSONVILLE-HEDDING RD BORDENTOWN NJ 08505
7. Lesley Gifford	Paglionia Agency	761 Delaware Ave. Bordentown NJ 08504
8. Mary Paglionia	Paglionia Agency	761 Delaware Ave. Bordentown NJ 08504
9. Robert W. Kelly	Kaplan & Sons	4 Florence NJ 08504
10. Florence Vancura		oaklawn Ct R.R. 2 Box 113 Columbus NJ 08022
11. Victor Vancura	" " " "	" " " "
12. Michael Bumbaca Jr		2082 Burlington-Columbus Rd R.D. 1 BORDENTOWN NJ 08505
13. Virginia Emersick		140 Coachman's Dr R.D. 1 Bordentown NJ 08505

PLEASE PRINT

- | NAME | AFFILIATION | ADDRESS |
|---------------------------|---------------------------|------------------------------------|
| 14. CHIEF RICHARD YACISIN | FEDERAL TWP ROCK MOUNTAIN | Box 3000 St. Paul |
| 15. Wade Kessler | Township of Rock Hill | Rock Hill, N.C. |
| 16. Robert E. McCann | 42 Tall Timber Ln | Burl N.T. 05066 |
| 17. Bob Simkins | County of Burlington | 49 Ransom Rd Mt Holly |
| 18. CHARLES BAUER | Mansfield Twp | RD-1 Box 322 Rockport 08090 |
| 19. My family | Rock Hill Twp | 1501 3rd St Rock Hill, S.C. |
| 20. Anne Curran | RR02 Box 309 | Columbus NJ Puke |
| 21. Julia Vander Molen | RD2 Box 91 | Columbus NJ |
| 22. Eric Thomas | Box 103A | Gauley Bridge Pa |
| 23. Thomas Stevenson, Jr. | Jacksonville | Hedding Rd. Box 230E Borden Town |
| 24. Justin Herbert | 14-16 Beacon Hill Dr. | Holland Pa. 16101 |
| 25. Thomas Cargill | 36 Pinewood Dr. | Durham 05801 |
| 26. Jack Stetson | 12 Kensington Dr | Martins 05405
PUKE |
| 27. HERBERT MEIRE | 2081 | Burl. Col RD Borden Town 08090 |
| 28. Ted Myers | | Delmar by Mail 0249 Wilbur Hwy/Dt. |
| 29. Verna K. Kelly | | Florence, N.J. 08518 |
| 30. | | |

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indicating the deposition of hazardous waste is the NJDEP hazard ranking form and the NJDEP industrial survey generator reports. RIFS, Volume II, Remedial Investigation, at 1-4. Neither of these sources is firsthand; and there is no confirmation by Black & Veatch that hazardous wastes exist at the site in any but the most nominal amounts, amounts expected to be found at a landfill where ordinary household chemical materials are deposited with municipal solid wastes. Indeed, the only hazardous substance encountered in detectable amounts during the Black & Veatch site investigation was landfill-generated leachate, to be expected in any sanitary landfill. RIFS, Volume II, Remedial Investigation, at 3-1. Leachate has been pumped out of the landfill since closure of the landfill; the hazardous substance concentration in the leachate, which has typically declined in strength over time, is no more than "average" and for some constituents lower than average than that found in "typical sanitary landfill leachate." RIFS, Volume II, Remedial Investigation, at 3-11. Moreover, according to Black & Veatch, the pH level, an indicator of hazardous levels, "falls within the normal range of sanitary wastes." Id.

In sum, Black & Veatch's study confirms earlier

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conclusions that "no significant adverse impact on the environmental surroundings or public health have been imposed by the facility to date," almost five years after landfilling ceased. RIFS, Volume II, Remedial Investigation Summary, at i.

NJDEP's exorbitantly expensive and thorough site investigation demonstrates that this landfill should never have been designated as a superfund site. FLR objected to that designation back in 1983, when EPA first decided to list the site, and reiterates its contention that this designation is without basis and will result in NJDEP expending government resources on unnecessary studies and remediation measures that constitute overly expensive and unwarranted closure procedures. The Black & Veatch RIFS demonstrates that this site was improperly placed on the National Priority List and should be delisted now, before additional funds are expended for closure measures which the Remedial Investigation shows are unnecessary.

Surely the full panoply of remedial measures listed in Black & Veatch's alternatives 3 through 7 identified in its Feasibility Study should not be undertaken. Given the results of the Remedial Investigation, it is clear that

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the cover material and cap called for in alternative 5 is unnecessary and exceed NJDEP's current requirements and even its probable future requirements for capping a closed landfill as set forth in its proposed closure regulations. See 18 N.J.R. 914 (May 5, 1986). FLR has already capped the landfill with acceptable, low-permeable clay soil from the Merchantville Formation in accordance with their closure plan; additional capping should only, at most, have to meet the proposed requirements, which are exceeded in Black & Veatch's alternatives.

Moreover, the slurry walls or contaminant barriers called for in alternatives 3 and 5 are also unnecessary and would not be required in a normal sanitary landfill closure, which is all that should be required for this site. DEP's proposed new closure regulations only require cut-off walls where there is a need to "restrict the lateral migration of leachate, provide for a complete contaminant system and prevent pollution of the underlying aquifer." 18 N.J.R. 909. At this site there has been no demonstrated lateral migration of leachate, nor should any be anticipated, and the underlying aquifer is well protected by the clay stratum that contains the wastefill. Moreover, FLR's earlier closure

MIELE, COOPER, SPINRAD & KRONBERG

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plan included the construction of cut-off walls, which were obviously performed as intended to prevent leachate migration and contain any contaminants. Finally, the proposed slurry walls fail to take account of the fact that this site will soon be surrounded by the proposed Burlington County Waste Management facility. Any chance of lateral migration of leachate from this site will be foreclosed by the containment barriers which must be constructed under DEP regulations in connection with the operation of that facility.

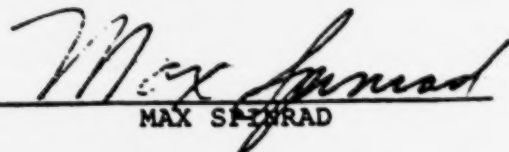
Under these circumstances, the remedial measures proposed by Black & Veatch is not justified by its own investigation, or by NJDEP requirements. This site should be delisted and the government's time and money concentrated on sites legitimately in need of the exorbitant type of remedial measures proposed here, for what should be an ordinary landfill closure.

I appreciate your consideration of the above. FLR stands ready to meet with you and other NJDEP representatives to discuss this subject in detail.

Very truly yours,

MIELE, COOPER, SPINRAD & KRONBERG
Attorneys for Florence Land
Recontouring and Florence
Land Development

By:


MAX SPINRAD

114

cc: Beth I. Muhler, Site Manager



NEW JERSEY FIRST INCORPORATED

ENVIRONMENTAL MANAGEMENT CONSULTANTS SERVING BUSINESS AND GOVERNMENT

10 June 1986

Ms. Beth I. Muhler
Hazardous Site Mitigation Administration
CN 028 - NJDEP
Trenton, New Jersey 08625

Dear Ms. Muhler:

As an environmental adviser to Florence Land Recontouring Incorporated and Florence Land Development, I have reviewed the 12 May 1986 report of the Remedial Investigation/Feasibility Study of the FLR landfill done by Black & Veatch. I am presenting these comments for the record of the public meeting to be held by the Department of Environmental Protection on 12 June 1986 concerning this study:

1. Neither this study by Black & Veatch nor other studies which preceded it have discovered evidence of the discharge, potential discharge or even the presence of hazardous wastes disposed of at the landfill site.
2. The failure of comprehensive investigation to discover such evidence indicates that the landfill should not be included on the EPA's National Priority List as a Superfund site.
3. The B&V study shows that the leachate and gases produced in the landfill are of a character consistent with that found in a typical municipal solid waste landfill.
4. The Department's landfill closure regulations and NJPDES permit requirements should govern the design of the Florence landfill closure.

Sincerely,

Richard J. Sullivan
Principal

RJS:jeb

230E Jacksonville-Hedding Road
RD1 Bordentown, New Jersey 08505
June 20, 1986

New Jersey Dept. of Environmental Protection
Office of Community Relations
CNO28
432 East State Street
Trenton, New Jersey 08625

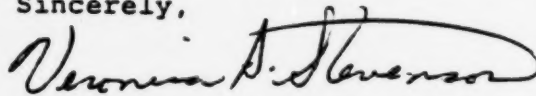
Attention: Mr. Jeffrey Folmer

To the Members of the New Jersey Dept. of Environmental Protection:

In an effort to convey to you the very serious concerns of the residents of Springfield Township, Burlington County, regarding the Florence Land Recontouring Landfill Site located in Florence and Mansfield Townships, a petition bearing 404 signatures is enclosed. Those signing the petition live nearest the western portion of the Township (west of U. S. Highway 206), living in very close proximity to the landfill.

As the petition states, the residents are urging the approval of a total clean-up and removal of contaminants on the landfill site. We are also petitioning the Committee Members of Springfield Township to join with Mansfield and Florence Townships in their efforts to completely eliminate this health-hazard and to restore to us the clean environment to which we are entitled.

Sincerely,



(Mrs.) Veronica A. Stevenson

Encs. - petition -pages 1-24

JUNE 1986

PETITION TO: THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS SITE MITIGATION

FROM: RESIDENTS OF SPRINGFIELD TOWNSHIP, BURLINGTON COUNTY, NEW JERSEY.

WE, THE UNDERSIGNED RESIDENTS OF SPRINGFIELD TOWNSHIP, WISH TO MAKE KNOWN OUR CONCERN REGARDING THE FLORENCE LAND RECONTOURING LANDFILL SITE LOCATED IN FLORENCE AND MANSFIELD TOWNSHIPS. BECAUSE OF THE HIGHLY TOXIC WASTE KNOWN TO EXIST ON THE SITE AND THE VERY PROBABLE LIKELIHOOD OF CONTAMINATION OF THE WATER SUPPLY, WE URGENTLY PETITION THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION TO APPROVE TOTAL CLEAN-UP AND REMOVAL OF ALL HAZARDOUS COMPOUNDS IN THIS SITE.

THE HEALTH AND WELFARE OF ALL RESIDENTS IN THIS AREA IS AT STAKE. OUR LIVES ARE ENDANGERED AND WE PLEAD FOR IMMEDIATE ACTION!

NAME (PRINTED)

ADDRESS

SIGNATURE

Joseph P. Wolfrom II 224 Jacksonville-Hedding Rd. Joseph P. Wolfrom II

Donna H. Wolfrom 224 Jacksonville-Hedding Rd. Donna H. Wolfrom

Florence Balsavage 223 " " " Florence Balsavage

Sandra A. Lloyd 225 Jacksonville-Hedding Rd. Sandra A. Lloyd

Todd Lloyd 225 Jacksonville-Hedding Rd. Todd Lloyd

Gabriel Teidmann Jacksonville Hedding Rd. Katherine Teidmann

Douglas R Long Rd 1 Box 226 Bordertown Douglas R Long

Ann L. Long Rd 1 Box 226 Bordertown Ann L. Long

James B. Ellis RD 1 Box 226A Bordertown James B. Ellis

VERIS M. ELLIS RD 1 Box 226A Bordertown Veris M. Ellis

Robert F. Schetter Bx 226B, Jacksonville-Hedding Road, Springfield Robert F. Schetter

Judith M. Schetter Box 226B Hedding Rd, Bordertown Judith M. Schetter

Raymond L. Malsbury Hedding-Jacksonville Rd. Raymond L. Malsbury

LAW OFFICES
PARKER, McCAY & CRISCUOLO
A PROFESSIONAL CORPORATION
SUITE 401
THREE GREENTREE CENTRE
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MARLTON, N. J. 08053
(609) 596-8900

June 23, 1986

File No. 1091-0005RCM

Mr. Jeffrey Folmer
NJDEP Division of
Hazardous Site Mitigation
CN 028
432 E. State Street
Trenton, N.J. 08625

Re: Written Comments on RI/FS Prepared by Black and Veatch
Engineering Architects Regarding Florence Land Recontouring
(FLR) Landfill

Dear Mr. Folmer:

This office serves as Solicitor for the Township of Mansfield. I attended the June 12, 1986 Public Meeting held by NJDEP at the Fountain of Life Center in Florence Township and expressed certain comments and concerns on behalf of Mansfield and Florence Townships with respect to the RI/FS Report prepared by Black and Veatch (hereinafter referred to as B&V).

At the meeting, Anthony Farro, Assistant Director of the NJDEP, Division of Hazardous Site Mitigation, indicated that additional written comments would be accepted by NJDEP and EPA on or before June 23, 1986 and that these governmental agencies and/or B&V would respond to each comment and concern in writing. Grace Singer, Chief of the Office of Community Relations in the NJDEP Community Relations Program indicated that all written comments should be addressed and directed to you for appropriate response.

This letter is intended to summarize and expand upon the verbal comments that I posed at the June 12, 1986 meeting and raise certain additional technical comments and concerns which merit a written explanation and response.

My comments are as follows:

1. SCOPE OF STUDY. Governmental, public and judicial knowledge can certainly be taken with regard to the serious domestic water supply contamination problem in private potable water supplies

located in proximity to the FLR Landfill. Vinyl chloride, methylene chloride, chloroethane, 1-2-dichlorobenzenes, bis (2-ethyl hexyl) phthalates, arsenic and numerous other carcinogens have been found in significant concentrations in domestic water supplies in both the shallow aquifers and the Pleistocenes deposits and the deep Raritan-Magothy Aquifer.

Some of the concentrations of these contaminants are in excess of five (5) times the concentrations found in field blanks and therefore merit further intense investigation. This data has been compiled over the last several years as a result of tests performed by NJDEP, EPA, Burlington County, Mansfield Township and private water well investigations by concerned residents.

Mansfield Township has, in fact, expended a great deal of time and money with regard to its efforts in having its ground water hydrologist, Dan Raviv Associates, perform water tests throughout the township in an effort to analyze contaminant data and contaminant sources.

The alarmingly high cancer occurrences and cancer related deaths experienced by residents living in close proximity to the contaminated waste fill area has been repeatedly communicated to various EPA and NJDEP officials over the last several years. Cancer occurrences in the area of the township where the FLR Landfill is located exceed the New Jersey average by approximately three hundred (300) percent.

At a conference in Washington, D.C., prior to the award of the RI/FS contract to B&V, William N. Hedeman, Jr., then Director of the Office of Emergency and Remedial Response in the Federal Superfund Program, indicated that the domestic water supply contamination problem would be investigated in conjunction with and as a part of the RI/FS for FLR and that remediation of FLR would be coordinated with the location and construction of the Burlington County Solid Waste Management Facilities Complex proposed by the Burlington County Board of Chosen Freeholders on the parcel of land adjacent to the FLR Landfill site.

Township representatives have repeatedly expressed their concerns over deferring commencement of waste filling operations in the new County landfill next to the FLR Superfund site until remediation has been completed and domestic water supplies are free from contamination. The Township has also expressed an additional concern pertaining to the location of a 1,200 unit adult community, which is now being completed, which is supplied by water with two on-site wells. This development is located approximately one mile from the FLR Waste fill area. Mansfield and Florence Townships were, therefore, under the opinion and belief, based upon representations from NJDEP and EPA, that the scoping of the project included an expansive investigation, dealing with both source and off-site

contamination and environmental concerns, and that the factors set forth in 40 CFR Section 300.68(e) would be incorporated into the RI/FS analysis. Pursuant to subsection (e)(1)(3i) of 40 CFR Section 300.68(e), the expanded analysis would necessarily include an analysis of "contaminated drinking water at the tap" and remediation measures responding thereto, including provision for water supplies.

All of these concerns were again expressed at the first public meeting arranged by your office which was held on May 2, 1985 at the Florence Township High School prior to preparation of the RI/FS by B&V. Both townships and their residents were led to believe that such an expanded analysis was part of the study, especially in light of the following statements contained in Section 2.4, entitled Potable Water Supply Well Inventory, on Page A-14 of B&V's Project Specific Proposal for FLR:

"As part of the field operations, a survey of domestic and any public, water supplies within a 1-mile radius of the site will be conducted. The purpose of this survey will be to identify domestic water supply wells that may have been impacted by contaminant migration from the site and to further define the geologic and hydrologic conditions in the area."

Needless to say, the Townships were dismayed to find, upon receipt and review of B&V's RI/FS Report two weeks ago, that B&V did not investigate domestic water supplies within one mile of the contaminated waste fill area as represented, but, instead, simply tested twenty domestic wells located in close proximity to the waste fill area. The Township officials and the residents and professional consultants were equally dismayed that B&V did not expand their investigation and study upon finding contaminants in those wells sampled. B&V simply indicated that further tests should be conducted in the future with respect to these issues and, as will be discussed in subsequent comments, indicated that the contaminant source might not be the landfill inasmuch as the same or similar contaminants were found in both upgradient and downgradient wells.

Based upon the limited scope of the investigation, B&V concluded in its RI that the contamination was "source contained". The remediation alternatives suggested in the FS were predicated upon and presuppose the accuracy of this conclusion in the RI. The Townships feel that the remedial alternatives may not accurately or fully address the nature, scope and breath of appropriate remedial measures if the supposition in the RI pertaining to "source contamination" is incorrect, unsubstantiated and/or inconclusive.

2. ENDANGERMENT ASSESSMENT AND ENFORCEMENT ACTION. The Townships were advised by EPA and NJDEP that an enforcement action would be brought by the government(s) under CERCLA to recoup its

costs incurred resulting from investigation and remediation. However, Page 5-58 of the FS (Volume 3) indicates as follows:

"An endangerment assessment is often prepared as part of the public health assessment for enforcement-related remediations. Since the remediation to be performed at the FLR Landfill is not currently defined as an "enforcement action" under CERCLA, a separate endangerment assessment has not been performed."

NJDEP's enforcement attorney was present at the June 12, 1986 public meeting and representations were made at the premeeting conference with the Municipal officials that an enforcement action would be brought by the government. The Townships request written confirmation that an "enforcement action" under CERCLA will be instituted by the government and that a separate endangerment assessment will be performed and made available to the Townships within the next several weeks. The Townships have incurred substantial investigatory and remediation costs on their own and may wish to commence litigation to recoup their costs. I am advised that Florence Township has already filed a "Notice of Claim" under CERCLA.

3. GEOLOGIC AND HYDROLOGIC ANALYSIS

A. Groundwater flows. Both the RI and FS devote substantial verbage to an explanation of groundwater flows in both the shallow aquifers in the Pleistocene deposits and the deep Raritan-Magothy Aquifer. Reference is made to prior studies and reports focusing on the geologic and hydrologic analysis of the site by Geraghty and Miller, Inc. (G&M), Woodward-Clyde, Richard A. Alaimo Associates, Princeton Aqua Sciences, Inc., and Roy F. Weston. Page 5-30 of the RI (Volume 2) indicates that "The configuration of the potentiometric surface contour lines (See Figure 5.7) indicates a general ground-water flow direction from the northwest to the southeast and south, toward Assiscunk Creek". Several sections in both the RI and FS indicate that this "flow description" applies to both the shallow aquifers and the Raritan-Magothy Aquifer. Other sections in the reports indicate that this "flow description" only applies to the shallow aquifers in the pleistocene deposits. The Townships request written clarification from B&V as to whether this "flow description" is limited to an analysis of the shallow aquifer flows and/or whether the "flow description" is also applicable to flows in the Raritan-Magothy Aquifer. At the June 12, 1986 public meeting, Lawrence J. Hosmer of B&V presented a slide which was shown to the public which appeared to indicate that the flow description applies only to the shallow aquifers in the pleistocene deposits.

B. Changes in Groundwater Flow. As indicated previously, B&V has offered an opinion that the groundwater flow is from the north-

west to the southeast to the south towards the Assiscunk Creek. B&V has concluded that the contamination found in "upgradient" wells cannot be caused by the landfill inasmuch as the landfill is hydrologically "downgradient". B&V has also indicated that groundwater flows can be changed by heavy water utilization and pumping in the area. The townships feel that an explanation is in order from B&V to reconcile these two statements and opinions. The Townships request written confirmation from B&V that the contamination found in the supposedly "upgradient" wells cannot possibly be coming from the FLR waste fill area.

C. Outcrop Area and Recharge of Raritan-Magothy Aquifer. B&V indicates that the waste fill area is located in close proximity to the Raritan-Magothy recharge area and that this aquifer is recharged by the Delaware River and through vertical downward infiltration from overlying water sources. B&V has also indicated that the Merchantville Clay Formation, which overlies the Raritan-Magothy Aquifer, "...is fairly irregular and suggests the presence of remnant fluvial-induced, erosional features.". Notwithstanding the foregoing comments, B&V has determined that the existence of the Merchantville Clay Formation can be expected to protect the Raritan-Magothy Aquifer from leachate contamination. These statements and this analysis appears to conflict. If the Raritan-Magothy is "impermeable", the Raritan-Magothy Aquifer would not be able to be recharged by vertical seepage from shallow aquifers. The Townships request a written explanation from B&V further expanding upon the "permeability factors" of the Merchantville Clay Formation. It is also to be noted, as I advised at the June 12 public meeting, that Beatrice Tylutki testified in court proceedings in the late 1970's that the Merchantville Clay Formation had been pierced under the waste fill area and that the waste fill leachate was then contaminating the Raritan-Magothy Aquifer. An explanation is in order as to why DEP and B&V's current statements seem to conflict with prior court testimony given by a former DEP employee. In summary, DEP's position during the Court proceedings in the 1970's was that the Merchantville Clay Formation had been pierced and that the waste fill area was contaminating the Raritan-Magothy Aquifer. DEP and B&V's current position appears to be that the Merchantville Clay Formation has not been pierced and that there is no contamination seeping into the Raritan-Magothy Aquifer.

3. SURFACE WATER IMPACTS AND SOIL SAMPLINGS. Methylene chloride was found in both the surface water and soil samples that were taken. B&V concludes that water quality in the Assiscunk Creek has "changed slightly in the last three years" and that several constituents exceed the State's water quality standards. A review of Table 6.1, which compares upstream and downstream stations, reveals that fecal chloroform, fecal strep and phosphate levels are all in violation of the State standards. A series of other chemicals, including phenol, were present in both the Assiscunk Creek and the drainage channel located adjacent to Cedar Lane extension. B&V

indicates that "it is also theoretically possible that these constituents are emanating from the waste fill since phenol was present in the water and BV-2S and pentachlorophenol was present in the soil in B-03.". B&V also found phalate contamination actually increased in concentration at approximately fifty-four feet into the Merchantville Formation. The existence of the methylene chloride contamination along with the other contaminants that were found at the levels that they were found in the soils and in the Assiscunk Creek should have spurred additional investigation by B&V. However, B&V simply reported the existence of the contaminants and stopped its investigation after rendering an opinion that the contamination could not be caused from the waste fill area. It is obvious to anyone investigating the FLR Landfill that it is the only source of contamination in those portions of Florence and Mansfield Township. B&V should have expanded its investigation as opposed to stopping its investigation when these contaminants, at the levels found, were detected.

4. REMEDICATION ALTERNATIVES. At the June 12, 1986 public meeting, DEP and B&V indicated that Alternative 3, with modifications thereto, would be the selected remediation procedure. The Townships feel that additional off-site monitoring wells should be included in the remediation process to further investigate contaminant levels. Additionally, provision for potable water supply for the residents in the area should be included in the remediation alternative. Many of the residents living in close proximity to the landfill have been drinking bottled water since the late 1970's. Installation of a water line connected to the Burlington Township public water supply is in order for the protection of these individuals.

5. BURLINGTON COUNTY SOLID WASTE MANAGEMENT FACILITIES COMPLEX. It is my understanding that 2-ethyl hexyl phthalate concentrations were found in wells that have been installed by Burlington County on the tract of land adjacent to the FLR Landfill where the new County Landfill is to be located. Based upon the B&V reports, this area is supposed to be "upgradient". An explanation is requested from B&V as to how this situation could occur. As referred to earlier in this letter, B&V has neglected to investigate the sources of the contaminants found in the supposedly "upgradient" wells. A more intense and detailed investigation and analysis of this issue must be conducted.

DEP must withhold additional approvals of the County Landfill project until these contaminant sources are located and remediation has been completed with respect to this Superfund site.

6. QUALITY ASSURANCE PROBLEMS. The accuracy of the lab tests and data that was compiled is questionable in light of all of the Quality Assurance problems and improper testing procedures utilized. The conclusions drawn by B&V are based upon the inaccurate and

PARKER, McCAY & CRISCUOLO

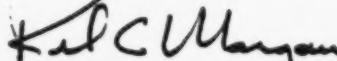
PAGE 7

incorrect data. It is suggested that retesting and reanalysis is in order to assure the quality of the lab results and data on hand.

Dan Raviv Associates will be forwarding its report to you with respect to certain technical hydrogeologic issues. The comments and concerns raised by Dan Raviv are intended to be incorporated by reference into this report.

The Townships look forward to promptly receiving B&V's written comments in response to this letter and Mr. Raviv's report.

Very truly yours,

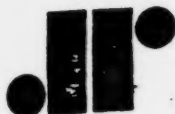


RONALD C. MORGAN

RCM:jm

cc: Dan Raviv
Marion E. Hay, Township Clerk

COMMENT LETTERS



Dan Raviv Associates, Inc.

Consultants in ground water hydrology, water quality and landfill hydrology

June 23, 1986

New Jersey Department of Environmental Protection
Division of Hazardous Site Mitigation
432 East State Street - CN028
Trenton, New Jersey 08625

Attention: Mr. Jeffrey Folmer

Re: Review Comments of RI/FS Report Prepared by
Black and Veatch Regarding FLR Landfill
Job No. 84C175

Gentlemen:

The following letter presents review comments prepared by Dan Raviv Associates, Inc. (DRAI) on the Remedial Investigation and Feasibility Study (RI/FS) of the Florence Land Recontouring (FLR) Landfill prepared by Black & Veatch (B&V). DRAI has been retained by the law firm of Parker, McCay & Criscuolo on behalf of the Townships of Mansfield and Florence, Burlington County, New Jersey.

Work performed by DRAI included a review of various documents relative to the RI/FS, supplied by the NJDEP, and verbal comments during the June 12 public meeting. Most of the hydrogeologic and geotechnical studies which were referenced to by the B&V study are available from the DRAI project file.

Introduction

Work conducted by DRAI included the following:

- (1) Review, evaluate, and comment on the sections of the RI/FS as it pertains to the geology, ground water, surface water and water quality.
- (2) Review and comment on the sections of the RI/FS which pertains to present and potential environmental impact from the existing FLR and the proposed Burlington County Solid Waste Management Facilities Complex (BCSWMFC).
- (3) Review and comment on the methods and procedures used to collect and evaluate hydrogeologic and water quality information in the vicinity of the existing and proposed facilities.

Mr. Jeffrey Folmer
NJDEP
June 23, 1986
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(4) Identify deficiencies relating to the collection of data needed to conduct a quantitative impact analysis of the proposed BCSWMFC on the hydrologic environment.

(5) Provide a general summary of the RI/FS review and evaluation.

Summary of Findings

The following summary is based on our review and evaluation of the RI/FS and supporting documents:

(1) The Florence Land Recountouring Landfill is a superfund site, ranked number 192 on the National Priority List and number 39 in New Jersey.

(2) Ground water is documented as occurring in a shallow aquifer (pleistocene) and a deep aquifer (Raritan-Magothy Formation). The Raritan-Magothy aquifer is a regionally important source of ground water. The two aquifers are separated by the Merchantville Formation. The Merchantville is described by B&V as a geologic unit having a low vertical permeability which allows minimal downward infiltration of ground water from the shallow aquifer to the deep aquifer. The Merchantville is also described as a source of recharge to the Raritan-Magothy aquifer.

B&V indicate that the Merchantville occurring in the study area consists of strata of clay, silt, and sand which are vertically and laterally discontinuous. The report is deficient in describing the occurrence and lateral movement of ground water in the Merchantville, which would impact potential contaminant movement from wastes in the overlying FLR landfill. A quantitative analysis of the rate of downward infiltration, based on differences in ground water levels between all three units, is also lacking in the B&V study.

(3) Ground water in the pleistocene aquifer and Raritan-Magothy aquifer is described as moving in a southeast direction. These flow directions are based on water level measurements taken at the FLR site only. The B&V study is deficient in information concerning the relationship between ground water flow directions at the site and the surrounding area. Consequently, evaluations concerning the impact of the FLR and proposed BCSWMFC on area ground water flow directions and potential contaminant migration routes cannot be made.

In addition, sampling of deep well BV-4D which was constructed to monitor upgradient conditions (background) in the deep aquifer indicated the occurrence of contaminated ground water. In our opinion, this well is located too close to the existing lagoons to be qualified as a background well. Mounding effects due to the operation of the lagoons may have caused downward and localized upgradient movement of contaminated ground water recharge.

Mr. Jeffrey Folmer
NJDEP
June 23, 1986
Page 3

(4) Testing of aquifer hydraulics at individual monitoring wells completed at the site was performed in order to obtain data on the localized ground water transmitting capabilities (transmissivity) of the tested aquifers. The evaluations are deficient in data pertaining to water level response in the Merchantville Formation during the tests. This data is necessary for quantification of the amount of ground water and subsequent routes of potential contaminants released to the Raritan-Magothy aquifer under pumping conditions (e.g. from ground water supply wells).

B&V indicate that no effects of pumping in the Raritan-Magothy were observed in the shallow aquifer. A positive response would be indicative of the potential for downward ground water movement and subsequent potential contaminant movement. A deficiency in this interpretation is that it is possible that the duration and rate of testing were too low to cause sufficient amounts of ground water movement during the short testing period. B&V indicate that a "significant recharge effect" was observed during the testing of wells completed in the Raritan-Magothy Formation. This effect may be the result of ground water being released from the overlying Merchantville Formation which has been characterized by B&V to be of low permeability and an effective barrier to downward contaminant movement, but also a source of recharge.

Many of the assumptions inherent in the methods of analysis used to evaluate the aquifer hydraulics testing data are violated due to their application to observations made solely in pumped wells. Consequently, the transmissivity values obtained from the evaluations are subject to error. The transmissivity values obtained by B&V for the Raritan-Magothy Formation are consistently lower (greater than an order of magnitude) than those reported by the USGS (Gill and Farlekus, 1976). Using lower transmissivity values might lead to a false sense of safety in determining if a pumping well, which was completed in the Magothy-Raritan aquifer near the site, could be affected by potential contamination.

(5) The study indicates the occurrence of numerous landfill affiliated contaminants in ground water at the FLR site. The B&V study initially states that methylene chloride was the only contaminant detected in sampled domestic wells located upgradient and downgradient of the site. The levels detected are reported by B&V to be significantly less than the suggested USEPA health advisory criteria. B&V indicates, further on in the study, that other contaminants (Acid Base Neutral Compounds) were found in the majority of the domestic wells sampled. The ground water quality in the area of the site is qualified by B&V as "good". No definitive statement is made concerning the sources of the detected compounds.

(6) It does not appear that B&V compiled well logs for the domestic wells which were sampled during this investigation. In addition the protocols for domestic well sampling are not presented in the RI

Dan Raviv Associates, Inc.

Mr. Jeffrey Folmer
NJDEP
June 23, 1986
Page 4

report. The results of analyses of samples obtained from domestic wells are dependent upon the location of the sampling point (e.g., water faucet, versus from the well). This dependency is due to the increased potential for aeration of the water samples with distance from the well.

(7) It is strange that B&V, after their 'extensive' sampling program, devoted one section of the RI (Section 10.0) as a disclaimer to the quality and the reliability of the analytical results of their investigation.

Conclusions

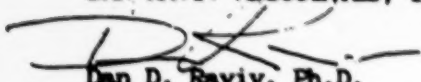
In summary, it is our opinion that the hydrogeologic conditions in the vicinity of the FLR landfill and proposed BCSWFC, their mutual interaction, and the potential impact on the local and regional aquifers and the local water supply wells, are not presented in an adequately quantitative manner in the RI/FS. Data deficiencies can be remedied by resampling and measuring water levels in residential wells in the area, adding wells within the shallow and deep aquifers as well as the Merchantville Formation in the vicinity of the FLR, and conducting additional aquifer hydraulic tests and data analyses.

In our opinion, the RI/FS is deficient in its treatment of the impact on regional hydrogeology, water resources, and water quality. An example of a cursory evaluation as conducted by DRAI of the regional hydrogeology and its interaction with the FLR is presented in Attachment I. We recommend that the appropriate sections be upgraded with quantitative data and that the RI/FS be amended.

If you should have further questions, or need additional information, please call.

Very truly yours,

DAN RAVIV ASSOCIATES, INC.


Dan D. Raviv, Ph.D.
President
DDR/lb

cc: Ronald C. Morgan, Esq.
Mayor William M. Aaronson
Mansfield, New Jersey
Mayor Sharon A. Worrell
Florence, New Jersey

Dan Raviv Associates, Inc.

Attachment I

Preliminary Interpretation of the Regional Hydrogeology in the Vicinity of the FLR LANDFILL

Introduction

As requested by Mansfield Township Environmental Commission, Dan Raviv Associates, Inc., (DRAI) has completed a cursory evaluation of the ground water conditions occurring about Mansfield Township and the Florence Land Recontouring (FLR) landfill. The purpose of this study was to evaluate the relationship between the regional hydrogeologic conditions and the FLR landfill.

The attached figures (Figures 1-9) and tables (Tables I & II) are based on information obtained from logs of domestic wells (obtained from NJDEP by Mrs. Dottie Wirth of Mansfield Township) and a report by Geraghty & Miller, Inc. (The Technical Evaluation of The Florence Landfill Recontouring, Inc., Landfill, May 1982).

Source of Information

Based on logs supplied by Mansfield Township, domestic wells can be categorized as either deep or shallow, depending on the depth of the well screen interval with respect to a regional hydrogeologic unit of low ground water transmitting capability (Woodbury Clay/Merchantville Formation). The logs of domestic wells reviewed by DRAI were compiled by the Burlington County Health Department in conjunction with the NJDEP. This study also utilized the logs of deep wells (38,39,40) as presented in the Geraghty & Miller, Inc. report.

The locations of wells used in this study are shown on Figure 1. The wells are located on the 7.5 min. U.S. Geological Survey Topographic Quadrangle Maps of Bristol and Columbus, New Jersey. The approximate ground elevation at each well was interpolated from these quadrangles and summarized in Table I.

Approximate static ground water elevations were interpolated from the obtained well logs. The respective ground water levels were measured at the time of well installation. Consequently, the dates of water level measurement range from 1951 to 1985. The wells are designated as shallow or deep depending on the penetrated aquifer. Ground water contour elevations in the shallow and deep aquifers are shown on Figures 2 and 3, respectively.

Hydrogeologic Setting

The ground water environment in the study site area is comprised of a shallow and a deep aquifer. The shallow aquifer is primarily comprised of sand belonging to the Englishtown Formation with localized areas of fill material (e.g., FLR Landfill) and stream deposits. The deep aquifer consists of clay, silt, and sand deposits belonging to the Raritan-Magothy Formation. The shallow and deep aquifers are separated by low permeability deposits comprised primarily of clay and silt belonging to the Woodbury and Merchantville Formations.

Ground water flow direction in the shallow aquifer is controlled by the surface topography, top of Woodbury Formation topography, and location of surface water bodies. Ground water flow in this aquifer is from areas of higher ground water elevation occurring to the northeast of the FLR, and radically towards all directions (Figure 2). Consequently, some of the ground water flow in the shallow aquifer is westerly across the Florence landfill. A high point in the top of the Woodbury Formation (Figure 4) concurs with the localized high point of ground water elevation in the shallow aquifer.

Regional ground water flow in the deep aquifer is controlled by the regional incline of the aquifer towards the east. Consequently, regional ground water flow is from the west, towards the east in the Raritan-Magothy Formation. The easterly incline of the Magothy-Raritan Formation from -50 feet msl in the west to -130 feet msl in the east is illustrated in Figure 5. The ground water contour intervals (Figure 3) indicate localized depressions in the ground water surface (potentiometric surface) of the deep aquifer near the Town of Columbus and general vicinity of the higher elevations of ground water in the shallow aquifer. These depressions are characteristic of conditions caused by the pumping of water supply wells and result in localized deviations of ground water movement from the regional pattern.

Summary

The above evaluations of ground water elevations and geologic unit occurrence are based on approximations obtained from logs of domestic and monitoring wells installed between 1951 and 1985. This cursory evaluation is intended as a general interpretation of regional trends in the vicinity of the FLR Landfill and Mansfield Township only. However, the evaluation presented is the first step for a regional assessment of ground water conditions based on the available historical data.

6-18-76

Dear Mr. Salmer,

Last week I attended the local meeting on the alternate proposals for the Florence Landfill. I am a resident of Mansfield Township & as a Taxpayer and Cancer patient, am greatly concerned at the lack of progress being made in addressing the contamination of private wells in the area.

We live about $\frac{1}{2}$ mi. from the dump. I am a widow age 43. My husband died of Colon Cancer 2 yrs. ago.

I also had surgery for
Colon Cancer & have blood
Tests every 3 mos.

We had our water tested
on Aug 2, 1985 by the EPA
and was found to have
700 parts per billion of bis-
2 ethylhexyl phbate. This
is certainly more than 5
times greater than the
valid contamination of 67
in the trip blank.

I think we've waited
long enough. The test was
10 months ago! Your report
indicated much study at

the landfill site & several proposals for future containment. But what about the cleanup of the existing problems off the site? We shouldn't have to buy water as I have been doing.

Please give this your careful consideration and immediate attention.

As for cleanup of our water, city water would be the answer.

Thank You
Rube Vander Molen

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Thank You
Rico Vander Molen

Township of Mansfield

BURLINGTON COUNTY

P.O. BOX 249

ATLANTIC AVENUE

COLUMBUS, NEW JERSEY 08022

MARION E. HAY
MUNICIPAL CLERK

MUNICIPAL COMPLEX
609-298-0542

June 20, 1986

State of New Jersey
Department of Environmental Protection
Office of Community Relations
432 East State Street
Trenton, New Jersey 08625

Att: Jeffrey Folmer

Dear Mr. Folmer:

Concerning the Department of Environmental Protection's Remedial Investigation/Feasibility Study for the Florence Landfill Recontouring Hearing held on June 12, 1986, I would like the following concerns be made a matter of record and be entered into the comments concerning the Florence Land Recontouring RIFS. My name is Dorothy Wirth. My positions are: 1). Chairman of the FLR Citizens Clean Up Committee, 2). Vice-Chairman of the Mansfield Township Environmental Commission, 3). Member of the Mansfield Township Planning Board.

I wish to address several issues. I will not take the time to reiterate the concerns of Dan Raviv, our Geo-Hydrologist or Ronald Morgan, our Attorney. However fully concur with all the issues that they have raised.

I would specifically like to discuss some previous water problems and testings that were alluded to in the RIFS.

We have had five sets of water testing done throughout the Township. Several of these sets of tests indicated the presence of specific pollutants. Other sets of tests indicated that levels of contamination were present, but no specific pollutants could be identified (similar to some occurrences in your RIFS water testing).

One set of tests was conducted by the E.P.A., we flew to Washington to petition them to assist us in searching for the source of our local water contamination problem. The testing done by the E.P.A. indicated the presence of Bis 2 ethylhexyl phalate. They concluded that this was a laboratory contamination since the trip blank showed Bis 2 ethylhexyl phalate at the level of 67 ppb. We had four locations all in close proximity to FLR that showed levels of Bis 2 ethylhexyl phalate from 700 ppb to 1200 ppb, more than five times that of the trip blank. This base neutral is a known carcinogen. It was found to be present at the FLR site in both your tests and the County tests in both the soil and the water. Three of the four homes that showed high levels of contamination with the above-mentioned chemical have had cancer deaths.

Department of Environmental Protection
Att: Jeffrey Folmer

June 20, 1986

In one of them, the husband, approximately 39 years of age, died of cancer of the colon. Six months later, the wife, also 39, was diagnosed as having cancer of the colon. All four surrounding neighbors have suffered the same ailment. One other died.

The house that showed levels of the same chemical at 1200 ppb also had a 38 year old man die of cancer. One of the other two homes with a level of over 700 ppb also had a cancer death.

In an admittedly unscientific survey, we found that the Hedding-Jacksonville Road had a 50% cancer rate. We have five cases of breast cancer in the distance of 1/2 mile. One owner of a house died of breast cancer. Subsequently, the house was sold. The new owner has now contracted and been operate on for breast cancer.

If we extrapolated our population so that we had 100,000 residents, our cancer rate would be 1450 per 100,000. The rate in 1985 for the State of New Jersey was 425 per 100,000 for men and 400 per 100,000 for women. Ours is three times greater. Because we have a great deal of concern over this situation, we petitioned the EPA, at a meeting in New York in September, to do a health survey. The D.E.P. spoke with me in approximately February of 1986 saying that they were considering asking that a health survey be included in the RIFS. Nothing was ever done concerning this. Because of this, our Township has been forced to make arrangements with experts from a leading university to assist us in conducting such a survey. Prior to doing this, we had directly approached the State Department of Health. We were told that a need must be shown, before they could institute a survey. They would not accept anything that we presented as being scientific and a sufficient reason for doing a health survey. Therefore, there was no way that we could persuade them to assist us in doing such a survey.

This has been a typical example of our relationship with the D.E.P. and various State agencies throughout the course of the RIFS. We repeatedly petitioned the D.E.P. to work closely with us during the course of the clean-up study. We are aware that Burnt Fly Bog, the Ellis site and Lipari have had many meetings and constant input during the course of the preparations for clean-up. We have been repeatedly told how busy and unable to attend meeting the D.E.P. officials were. Our treatment has been totally different than that at the other five sites.

We have a great concern that the site be adequately cleaned up due to the fact that the County Landfill will be located adjacent to the site.

Had we been given a freer range of access:

1. We could have made suggestions concerning locations of domestic wells that it would have been advisable to test.
2. We could have contributed the expertise of our Geo-Hydrologist.
3. We could have proven the need for a comprehensive health study.
4. We could have provided input that would have contributed to a more complete feasibility study that would be an accurate and adequate guide in selecting a proper means of clean-up.

Very truly yours,

Dorothy Wirth
Dorothy Wirth

Co-Chairperson, Mansfield Twp. Environ. Comm.
Chairperson, FLR Citizen's Advisory Committee

DW:mh

cc: Ronald C. Morgan, Township Solicitor
File

Township of Mansfield

BURLINGTON COUNTY

P.O. BOX 249

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COLUMBUS, NEW JERSEY 08022

MARION E. HAY
MUNICIPAL CLERK

MUNICIPAL COMPLEX
609-298-0542

June 20, 1986

State of New Jersey
Department of Environmental Protection
Office of Community Relations
432 East State Street
Trenton, New Jersey 08625

Att: Jeffrey Folmer

Dear Mr. Folmer:

The following concerns are to be a matter of record and entered into the comments concerning the Florence Land Recontouring RIFS:

I became involved in the FLR site in late 1978, so I am not unfamiliar or uninformed. For eight years, I've devoted much time and effort to the environmental issues surrounding this site. I'm on the Board of Directors of NJCA, worked actively on the N.J. campaign on toxic hazards, the Right to Know Bill and am a member of CCHW founded by Lois Gibbs of Love Canal.

I've testified before the Congressional Committee on the Superfund issue and am actively working with the N.J. Environmental Federation and the N.J. Environmental Lobby.

In January 1986, I began the first year of a three year term on my Municipal Committee, after having served on our local Board of Education and other municipal committees and community organizations. I am not a hysterical housewife.

I am totally familiar with the bureaucracy (which everyone refers to as red tape) in our Government. Bureaucracy is, (a) the administration of a government chiefly through bureaus and (b) the non-elective officials staffing such bureaus. It is also government marked by diffusion of authority among numerous offices and adherence to inflexible rules of operation.

The Easy Access directory put out by the DEP should be titled "No Easy Access". Direct answers are virtually impossible to obtain as is information and explanations. Unless of course a "Political" contact is obtained.

On the local level, we municipal officials are accountable to our people. On the State level, non-elected officials such as yourselves are not and cannot be held accountable. However, you can take this information presented here tonight back to the "Politicians" who will ultimately decide this issue and the fate of our two communities with respect to contamination exposure in our water, soil and in the air we breathe.

Department of Environmental Protection
Att: Jeffrey Folmer

June 20, 1986

Evidence has come to light over the past years that indicate that past and present land owners and corporate officers knew hazardous waste was being dumped at the FLR site. They must be held accountable for their irresponsible actions and open disregard for the safety and well being of our people and our natural resources.

This land was clean in 1973. Uncontaminated. None of the seven alternatives presented has a goal to restore this land to that condition.

There are actually only two alternatives. 1. Non-Action and 2. Containment. We all know what non-action means so I'll address containment. Its a so called "proven technology". Its proven - proven to fail. It doesn't render harmless the problem. Eventually the contamination will migrate. Caping is not permanent and containment only replaces one problem with another.

Other technologies have been identified and should be explored. The EPA's new SITE program (Superfund Innovative Technology Evaluation) began primarily to replace conventional cleanup methods that transfer risk or at best, contain the wastes, which is not a permanent alternative.

I direct your attention to Vol 2, RI Summary on page 10-5-Data Gaps, and I quote: "The reliability of the analytical data is also questionable since, in several instances, various holding times were exceeded. Although small exceedance for certain constituents should not invalidate the analyses, the results must be considered suspect. Of greater significance at the FLR Landfill site is that, in most instances, only low concentrations of contaminants are apparent in the samples. The presence of only low levels of constituents makes it difficult to actually quantify the extent of contamination. This fact, in conjunction with exceeded holding times, creates a situation where the levels of detected concentrations could be exceeded by the range of analytical error, or could be masked by background levels. Therefore, the low concentrations of contaminants apparent at the site could be potentially non-representative of the actual site condition.

Since only a single sampling event was conducted during this investigation, it is not reasonable to predict future leachate discharges from the site with a high degree of reliability. Predictions of future site performance are based on the current information incorporated with past studies. The absence of off-site contamination at the present time should not be misconstrued to imply that these discharges could not occur in the future; additional future monitoring would therefore be necessary to identify any contaminants plumes if they should form and migrate off-site. The presence of various contaminants in the waste disposed at the site identifies a potential for future discharges and the need for continuous monitoring."

I maintain that a technology for the clean up of the FLR site cannot be selected if the problem is not properly defined or if the RI/FS investigation is suspect or incomplete. By Black and Veatch's own statement on the Summary of Data Gaps, such is the case here.

Department of Environmental Protection
Att: Jeffrey Folmer

June 20, 1986

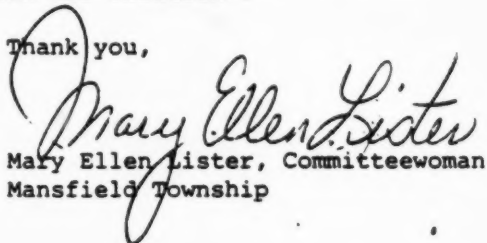
Further, there are constant references made to "low levels" of contaminants. There are many chronic health affects attributable to "low-level", long term exposure ranging from allergies, to depression, to cancer and leukemia. Low levels should not be interpreted as being "safe".

The DEP and the EPA are responsible for protecting the public health and the environment.

We urge you to pay strict attention to the testimony presented here tonight. We have done our homework as elected municipal officials. Now we expect you to do yours.

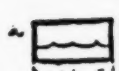
Finally, I ask you to keep this in mind: "We didn't inherit this earth from our parents, we are borrowing it from our children".

Thank you,


Mary Ellen Lister, Committeewoman
Mansfield Township

MEL:meh

cc: William M. Aaronson, Mayor
John R. Bereczki, Committeeman
Mary Ellen Lister, Committeewoman
Ronald C. Morgan, Township Solicitor
Mansfield Township Environmental Commission
Win Porter, Assist. Administrator, US EPA
File

 PUKE

June 18, 1986

N. J. Department of Environmental Protection
Office of Community Relations
432 East State Street
Trenton, New Jersey 08625

Dear Mr. Follmer:

I am submitting additional comments about the draft RI/FS for Florence Land Recontouring site.

Generally speaking, the alternative selected appears to be acceptable when compared with the other alternatives presented. Naturally, we would opt for removal of all wastes at the site as the most preferred course of action.

Addressing alternative #3 specifically is rather difficult without detailed design and engineering plans. This brings up the first suggestion and comment - the FLR citizens committee should be involved directly during the preparation of engineering and design plans. I would urge the site manager to share all draft plans, reports, schedules, etc. with the committee to assure prompt and comprehensive feedback, as well as being an ideal vehicle for disseminating correct, complete and timely information to the local citizenry. The suspicion, distrust and, I daresay, emnity evoked at the June 12th meeting can only increase, if no positive steps are taken by your office. Full disclosure of your plans will be the best protection against rumor, resistance and opposition in your already difficult job. Full involvement of the citizens' committee will demonstrate the level of confidence you have in your plans and their results. It will also serve as a methodology for resolution of citizens' concerns about the remediation heightened by the dispute over technical issues.

Alternative #3's implementation raises serious concerns about one, the criticality of the Health and Safety Plan and two, long term monitoring of air and water, especially for contamination to the Raritan-Mogothy aquifer.

We maintain that our township officials should insist upon a detailed Health and Safty plan which contains adequate measures to prevent on-site incidents, and detailed contingency plans to handle on-site emergencies. These plans and actions must provide for the safeguarding of all residents' health and safety. The input of the FLR citizens committee would be essential for such questions as:

1. How do you plan to coordinate emergency response efforts with the fire and police?
2. What plans exist for early warning of residents in the event of an emergency requiring evacuation?
3. What security and surveillance measures at the site at night are you proposing?
4. Decontamination procedures, contractor liability and reimbursement for loss of property due to off site contamination during construction?
5. What plans for traffic control exist during construction?

We plan to provide our suggestions on these and similar questions to you in the near future when we offer our health and safety plan requirements.

Our second concern is after the remediation is complete. With the continued presence of the wastefill at FLR, long term air and water monitoring are a vital necessity. Again, we strongly urge citizens involvement through direct access to all air and water monitoring plans, designs and reports. In addition, we believe that the FLR citizens committee must receive copies of all monitoring reports rendered to the State by the contractor directly from the State. Such a direct mailing will demonstrate good faith on the part of the State and contractor performing the monitoring. Transmittal through township officials to the citizens committee would be deemed unacceptable in any proposed monitoring plan.

We will propose to you a geophysical monitoring program employing the use of surface measurements of the electromagnetic conductivity and/or galvanic resistivity of the earth water materials underlying the site to detect leachate plume movement. We believe this methodology offers a cost effective, long term monitoring and detection system.

In closing, I again reiterate the necessity to involve the FLR citizens committee in all future plans.

Sincerely,



Herbert Meire, President
People United for
Klean Environment

Township of Florence

MUNICIPAL COMPLEX
BROAD STREET
FLORENCE, NEW JERSEY 08518
609-499-2525

June 18, 1986

Mr. Jeffrey Folmer
NJ Department of Environmental Protection
Office of Community Relations
CN 028
432 E. State Street
Trenton, NJ 08625

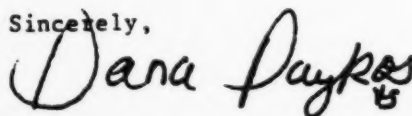
Dear Mr. Folmer:

The members of the Environmental Commission of Florence Township attended the recent public meeting on the completion of the Remedial Investigation/Feasibility Study at the Fountain of the Life Center and would like to express concern on the exclusion of a health impact accessment.

The accessment is underscored by numerous cases of cancer along with physical maladies of people living in the proximity of the Florence Land Recontouring Site.

We are looking forward to your consideration in this vital matter.

Sincerely,



Dana Paykos
Chairman of Environmental Commission

DP:ts

June 20, 1986

Written Comment to the
Remedial Investigation and Feasibility Study
for the
Florence Land Recontouring Landfill

I would like to start by saying that I'm very disturbed and disappointed with the vague, contradictory and redundant information making up a large part of the Remedial Investigation and Feasibility Study formulated by Black and Veatch and the Department of Environmental Protection of New Jersey for the fee of nearly a half a million dollars.

I would like to address a few specific statements and concerns that I feel are very important to the public.

The general summary (Vol. 2, pg 1) states that "the investigations conducted at the F.L.R. Landfill site indicate that no significant adverse impact on the environmental surroundings or public health have been imposed by the facility to-date."

By the very definition of a "superfund" site, this seems to be a contradiction.

Additionally, in a two page fragment of the Remedial Investigation, received just before the hearing, there was a list of twelve volatile organic compounds detected in the Black and Veatch monitoring wells,

2.

three acid compounds, heavy metals including arsenic, chromium, lead, nickel, zinc, iron and manganese. These heavy metals are concentrated in the soils also. This translates into a variety of environmental threats and health hazards to anyone in the immediate vicinity (and is suspect in the large number of cancer cases within a mile or of this facility), as well as being an eventual, if not already existing, threat to anyone who uses the water from the expansive Raritan-Magothy aquifer. Contaminants in the ground water and soil now, will be soon, if not already, in this precious water supply that feeds not only southern New Jersey but also the state of Delaware.

Of further interest is the fact that the Pleistocene deposits and the Woodbury clay have been removed and the wastefill is deposited on and in the Merchantville clay (Vol. 2, p. iii, fig 4.5/4.8), therefore these contaminants are in the Merchantville clay and by the nature of the volatile organics (they go through clay like it doesn't exist the other contaminants and the recently discovered glauconite in the Merchantville clay - in addition to the already broken clay barrier (Weston Report 1976) we should expect that the contaminants will travel through the clay and into the Raritan-Magothy aquifer. In fact, di-n-butyl phthalate and butyl benze phthalate (Vol. 2 p. 7-11) were determined to increase in concentrations

3.

at approximately 54 feet in the Merchantville Clay. The Raritan-Magothy aquifer is at 59 feet (Vol. 2 p. 7-11)

Levels of metal contamination increase along hydraulic gradient in the Merchantville formation to a depth of approximately 55 to 57 feet, leaving those contaminants two to four feet away from the Raritan-Magothy aquifer.

Further (in Vol. 2 pg iii) "since no significant contaminants were detected in the underlying potable aquifer of the Raritan-Magothy formation, it is reasonable to expect that the overlying Merchantville formation is an effective aquitard." This seems to be a misleading or inaccurate statement because it can't be an effective aquitard against contaminants if it is already riddled with them.

In Volume 2 (pg. 7-11) the report makes statements about the levels of contaminants with regard to dilution within the wastefill. I do not believe that it is hydrologically astute of the report to say that "the effects of contaminate migration from the landfill are limited due to the dilution of the contaminant in the surface waters of the Assisunk Creek". Because water dilutes the contaminants doesn't mean that there are less contaminants - only that they are more widely spread!

In Volume 3 (p. 1-10) the report states that ground water in the area is good - also domestic wells near the landfill (in the past 7 years) yielded water quality results termed "generally good". I have two problems with this statement.

#1 - There are no adequate standards for volatile organics in potable water supplies. (Volatile organics do not belong in potable water, period! - not even one part per billion. We can be killing people everyday with these substances in the water because the D.E.P. and E.P.A. will not recognize that the standard should be zero parts per billion!). Potable water should be "very good" or "excellent". The term "generally good" is very vague for a study of the magnitude, particularly when it concerns a major aquifer.

#2 - In the second paragraph after the previously mentioned one, the report reads "Sampling results of shallow wells screened within the waste fill have indicated the presence of organic compounds. If contaminants are in shallow wells, they will migrate down to the deeper aquifer - particularly if those contaminants are volatile organics whose chemical make-up allows them to move readily through clay. Also, if they are in the shallow

5.

aquifer at the landfill, they are most likely in the surrounding shallow wells of residents.

Because the ground water is relatively concentrated with arsenic, chromium, zinc, iron and total organic compounds, we might stretch our imaginations to suspect that this is the cause of the high rate of mysterious illnesses and cancer cases with a close proximity to the F.L.R. site.

In the Remedial Investigation Summary (Vol. 2, p.iii) it states "it is the opinion of Black and Veatch that off-site contamination may be contributed both by unidentified urban sources other than F.L.R. and limited contribution by the F.L.R. Landfill at this time. I don't doubt that further study is necessary, however I feel this statement conflicts with their initial statement in the general summary on page i of Volume Two.

At the public meeting on Thursday, June 12, 1986, Mr. Lawrence Hoerner (Black & Veatch) told me that the Heraghty & Miller ^{wells} were P.V.C. pipe instead of stainless steel like the Black and Veatch wells and therefore the tests for volatile organics from those wells are unreliable.

In summary, I find this entire report very questionable and certainly not worth the nearly \$500,000 that it cost.

I am concerned that important information may have been omitted from the report and other information softened to make this report appear less threatening.

Since there are so many statements to contradict "no significant adverse impact on the environmental surroundings or public health have been imposed by the facility to date" and since the Black and Watch representative, Mr. Hosmer stated that the authors of this report don't really mean that statement, I respectfully urge you to strike it from this report along with any other portions which are untrue.

As you have seen and heard, there are many public concerns with the environmental and health impact of the F.L.R. site, as well as the effectiveness of the clean-up alternatives presented in the Feasibility Study. I am very concerned with the feasibility of cleaning the before mentioned contaminated from the Merchantville clay, ground water, Assiscurk Creek and the Raritan-Magothy aquifer.

I ask, in closing, that all of these concerns
and those from others of my community, be
addressed thoroughly and with a high
degree of integrity.

Thank you.

Most Sincerely,

Mrs. Emily V. Del Vecchio
W. Main Street, RR2 Box 139
Columbus, N.J.
08022

MIELE, COOPER, SPINRAD & KRONBERG

Counselors at Law

90 MILLBURN AVENUE
MILLBURN, N. J. 07041

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LAWRENCE COOPER*
MAX SPINRAD*
MARTIN F. KRONBERG

* MEMBER N.J. AND N.Y. BARS

June 13, 1986

Mr. Jeffrey Folmer
N.J. Department of Environmental Protection
Office of Community Relations
CN 028
432 East State Street
Trenton, N.J. 08625

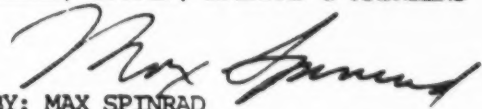
Re: FLORENCE LAND RECONTOURING - PUBLIC HEARING
HELD JUNE 12, 1986 CONCERNING RIFS

Dear Mr. Folmer:

Enclosed find a letter from the undersigned as counsel to Florence Land Recontouring together with an attached letter from New Jersey First, Inc. setting forth the position of our client relative to the RIFS conducted by Black & Veatch. Pursuant to the hearing conducted on June 12, 1986 relative to the above, kindly see that this 8 page letter from the undersigned together with the one page letter from New Jersey First, Inc. be made part of the record concerning the public hearing in this matter.

Very truly yours,

MIELE, COOPER, SPINRAD & KRONBERG


BY: MAX SPINRAD

CERTIFIED MAIL, R.R.R.

MS:SM

Encl.

cc: Mr. Richard J. Sullivan, w/o/enc.
New Jersey First, Inc.

cc: Anne R. Simonoff, D.A.G., w/o/enc.

cc: Beth I. Muhler, w/o/enc.
Hazardous Site Mitigation Administration

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June 11, 1986

Anne R. Simonoff, Esq.
Deputy Attorney General
Hughes Justice Complex
CN 112
Trenton, New Jersey 08625

Re: Florence Land Recontouring Landfill
Remedial Investigation/Feasibility Study

Dear Ms. Simonoff:

As the attorney for Florence Land Recontouring, Inc. and Florence Land Development (collectively "FLR"), I have reviewed the Black & Veatch Remedial Investigation/Feasibility Study ("RIFS"), dated May 12, 1986, concerning the Florence Land Recontouring, Inc. landfill (the "site"), which NJDEP provided to my clients. This study was conducted under the supervision and authority of NJDEP, which we understand is the lead agency in connection with possible remedial measures to be undertaken at the site. This letter constitutes FLR's official response to the RIFS and we therefore ask you to include it as part of the record developed in connection with the announced public meeting to be held by NJDEP on June 12, 1986. In addition, we enclose a letter from Richard J. Sullivan, the environmental consultant for FLR, which

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should also be included in that record.

The Black & Veatch RIFS is the most recent and most costly report in a series of environmental studies of this site, all of which have reached the same conclusion: that the health hazards or threat of environmental harm created by this site are de minimis and represent the normal, expected incidents flowing from the use of land as a sanitary landfill. Nothing in the Black & Veatch RIFS demonstrates any justification for this site's inclusion on the EPA's National Priority List as a "superfund site" under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §9601 et seq. ("CERCLA"). The Remedial Investigation in fact demonstrates that the lavishly expensive remediation alternatives set forth in the Feasibility Study are wholly unwarranted and represent overly complex methods of closure that exceed the normal requirements for landfill closure as set forth in proposed NJDEP regulations.

In 1982 Geraghty & Miller, Inc. performed a thorough investigation of ground water quality at and around the site for the County of Burlington. Its report, which concluded that the water quality parameters indicated values in the range of "normal" background levels, is consistent with

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other studies and the Black & Veatch investigation. See Technical Evaluation of the Florence Land Recontouring, Inc. Landfill, May 1982; Memo of Peter Sugarman dated October 21, 1982, to Edward Londres; RIFS, Volume II, Remedial Investigation, at 5-36 to 5-37, 5-42, 5-53. Indeed, Black & Veatch has concluded that any hazardous compounds found in the leachate were at lower concentrations than that found two years ago, indicating a dilution or "flushing" of contaminants in the wastefill, a normal incident of a typical landfill. See RIFS, Volume II, Remedial Investigation, at 5-50. In fact, the unanimous conclusion of the various reports is that the location of this landfill over the sixty foot thick Merchantville Clay formation, with its very low permeability, has "perched" the ground water above as effectively as would be done by a man-made liner system. See RIFS, Volume II, Remedial Investigation, at 4-11. Black & Veatch has unqualifiedly stated that "impacts on water quality down gradient of the wastefill are minimal." Id. at 5-57. The water quality in domestic wells in the vicinity downgrade of the site was found to be within acceptable limits except for iron and zinc, which were also found upgrade of the site and therefore are most probably from a source other than the

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landfill. In sum, "the ground water quality in the area is good." Id. at 1-5.

The nearby surface water has been similarly unaffected by the landfill. Black & Veatch has confirmed the earlier findings by Geraghty & Miller, Inc. that the landfill has "little or no impact on water quality" in nearby Assiscunk Creek. And the soil analysis performed showed that the materials detected in the waste were at "significantly lower [concentrations] than would be expected to occur in a sanitary or industrial waste landfill," presumably caused, as Black & Veatch has acknowledged, by the "effectiveness of the existing leachate collection system." Id. at 7-10.

As to air quality, no "elevated levels" of volatile organic compounds were detected at the site; merely the usual "nuisance impact" associated with most garbage landfills where waste is decomposing. See RIFS, Volume II, Summary of Remedial Investigation, at iii.

Inclusion of the site on the National Priority List under CERCLA was said to be because of the potential health and safety threats caused by this site as a result of the presence of hazardous wastes in significant quantities. But here, as Black & Veatch acknowledged, the only source